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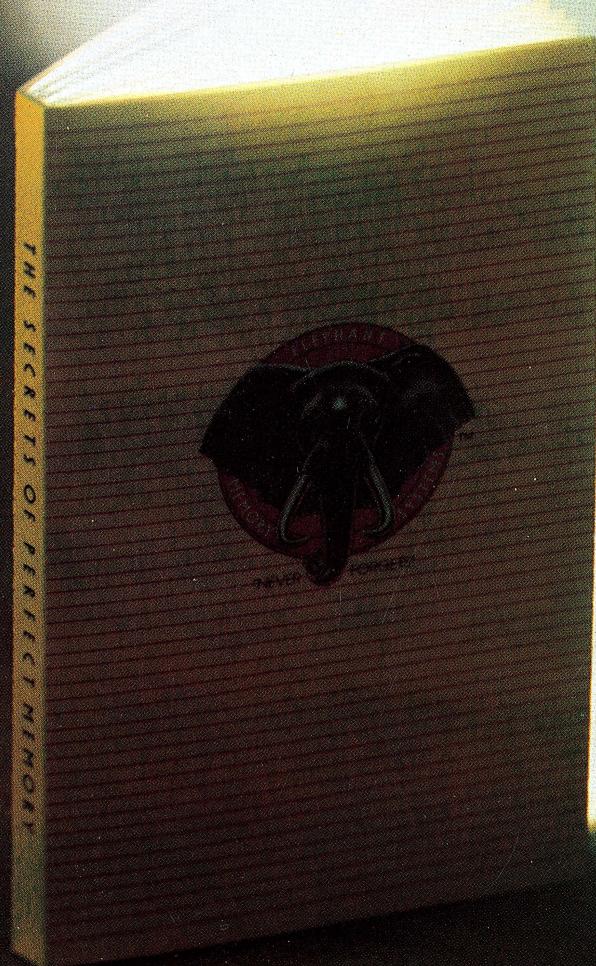
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(Sorry, I'd better stick to designing.)

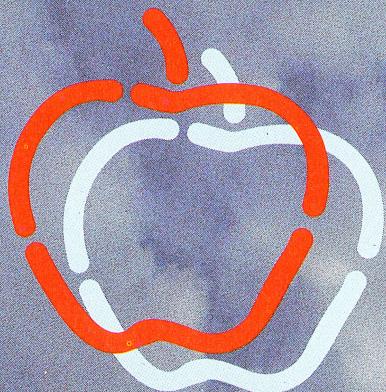
All my best,



APPIE O

Volume 5 Number 2 / February 1984
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Take a Bite...



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Apple Orchard

Vol. 5, No. 2

February 1984

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APPLE ORCHARD (ISSN 0277 - 1950) is published monthly for the International Apple Core by Orchard Potentials, Inc., 908 George St., Santa Clara, CA 95050. Second Class Postage paid at Santa Clara, CA and additional entry points. Subscription Rates (U.S. funds): \$24.00 for 1 year, \$45.00 for 2 years in the U.S., FPO & APO; \$30.00-1 yr., \$55.00-2 yr., in Canada; \$36.00 (surface), \$48.00 (airmail) in Mexico, Central America, Caribbean Islands, Philippines, Samoa; \$36.00 (surface), \$60.00 (airmail) in South America, Europe, North Africa; \$36.00 (surface), \$72.00 (airmail) in Asia, Middle East, South Africa, Australia.

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Textfile

For the second year in a row, Apple Orchard's February issue contains a thorough background and review of a significant new Apple product. Last year it was the Apple //e, which has proven to be more than just an upgrade of the Apple II Plus. More than 600,000 //e's are unofficially estimated to have rolled off the assembly lines this first year, with many more to come. For perspective, remember that about 750,000 Apple IIs were produced in about five years.

This year, though, Apple has something a great deal more revolutionary: the 32-bit Macintosh (do not spell it with a "k", please). Between these covers, you'll find comprehensive coverage of the newcomer. But as striking as Mac is, it's foolish to study this model alone; the proper focus is in the context of the Apple 68000 Family which has Lisa as its matriarch.

Apple's Macintosh Division has about 200 people, of whom 100 are in the factory. Led by company co-founder Steve Jobs, they're an active group, and they're proud of their product. Mr. Jobs stated their goal this way: "To get a computer into the hands of millions of people who wouldn't otherwise buy one." Mac will be described as a small Lisa, as a revolution, as an inexpandable oddball, as a portable, as a toy, as the easiest computer to use, etc. Depends on the describer's point of view.

One thing is beyond question: with Macintosh and the Lisa 2 (which runs Mac software as well as its own), Apple has the *big* computer event of the last nine months. It will be difficult for any (yes, any) company to approach the impact of these machines on the computer market in 1984.

Steve Jobs is nothing if not blunt: his summary on the huge effort put into Macintosh is, "If this doesn't work, we don't know what else to do." You are about to decide for yourself whether they've covered the bases.

Join us now for a guided tour of the future, conducted by Pat Caffrey, Gene Wilson, and Peter Weiglin.

Lest you believe that other Apple models have been forgotten in the rush, we have features for both Apple /// and Apple II, even reaching back into history for a few words on Integer BASIC. Neil Lipson goes into more detail on repairing your own Apple II, up to a point; and Woody Liswood reviews Spellbinder and the Prime Plotter.

And if the magazine looks a bit different inside, it's because of Mark Eaton, who has joined us as Art Director. His skill should alleviate many art and production headaches, for which I'm sure you'll be as grateful as we are.

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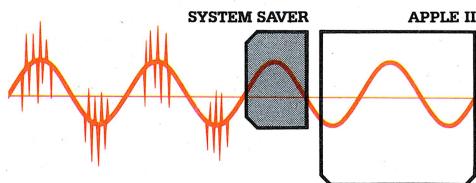
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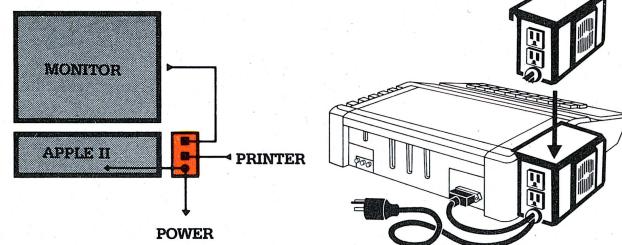
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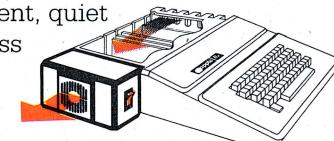


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*Softsel Computer Products Hot List. **PC Magazine: March 1983.

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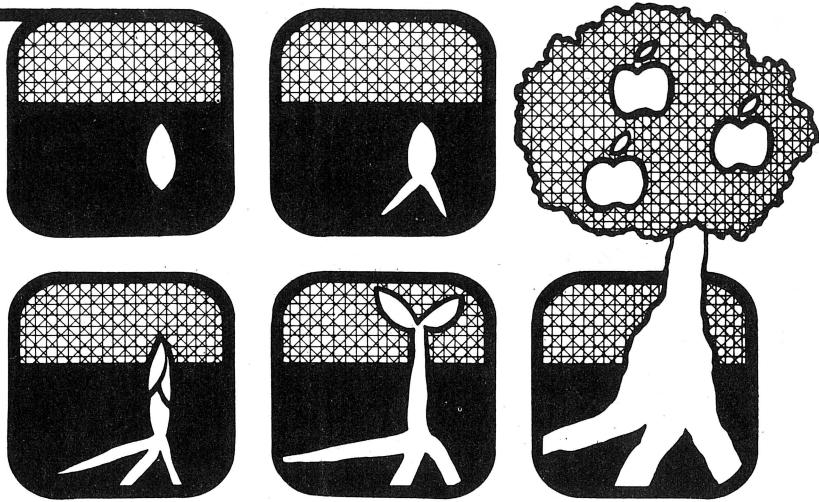
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Planting a seed...



The Family Perspective

Macintosh is here. But that's not all.

In the *Wall Street Journal* as far back as December 8, financial analysts were reported as saying that if Macintosh was not a success, Apple would cease to be a force in the microcomputer world.

Ah well, it's always a safe journalistic practice to focus on one product, and to set up potential conflicts and dramatic devices, but the reporters missed the point. Macintosh is a new computer, yes, but the important thing is that Mac is a member of a family.

The family is Apple's abuilding line of 68000-based computers, the first of which was Lisa, introduced 363 days before Mac. Now, the Mac software runs on a Lisa; in fact, the software developers for Mac had a head start because even before Macs were available, developers could use Lisas to create Mac software. There are now two products capable of working together.

A similar family concept is developing in the Apple // - Apple /// area. These machines are based on the 6502 chip. ProDOS allows the //s and ///s to interchange data. What we have, therefore, are two sets of "cousins". (There are some new 16-bit versions of this chip which we'll be reporting on shortly; *somebody* in Cupertino must have noticed them by now.)

True, the term "family" implies linkage, and Apple is developing a simple network for its family or families. So, we have decided not to focus on Mac alone, but on the entire 32-bit family (68000) and on the 8/16 bit family (6502).

We'll stipulate that the machines are great: now let's talk about marketing this family. H. L. Mencken said that no one ever went broke underestimating the American people. So it is that we read, simultaneously, (a) fair-to-poor reviews of Old Blue's latest machinery (no doubt a decent keyboard can

be made available as an option; if you want it to work, it costs extra), and we read (b) high sales projections; people are actually plunking down pre-release cash deposits.

A dealer confided that it takes less time to sell an "IBM Anything" than an "Apple Anything"; he leans toward efficiency, hence toward the fastest seller. But the history of marketing shows that companies with the fastest sellers become arrogant; margins are cut, minimums are raised, etc. That opens the door for another company to establish a better dealer relationship, and to increase its market share.

Market share on an individual product basis is interesting for internal comparison; the *family*, however, tells the story for the company.

Some of the computer and business magazines have been declaring IBM "the winner" in the microcomputer sweepstakes; that is, the game is over, even though the IBM products' superiority over the Apple is questionable, to say the least.

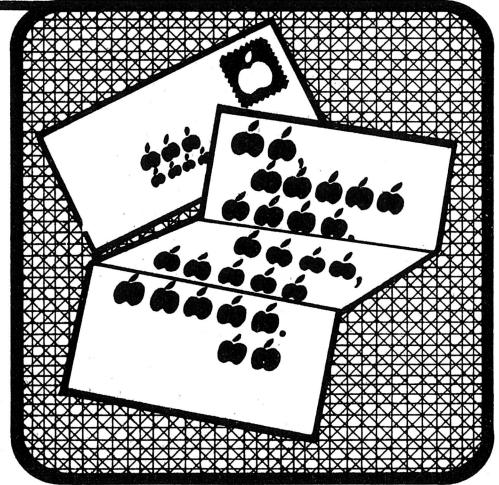
Macintosh isn't the last new product we'll see from Apple before the next stockholders' meeting; we can't say more right now without violating confidences. It is probably enough to say that Mr. Steven Wozniak is again involved with Apple engineering; your socks should be securely fastened.

"The Winner?" The game has just begun. And the families should do well.

A handwritten signature in black ink, appearing to read "Reebig".

Ask Us/Tell Us

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and comments to:
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Sirs,

Ronald Kennedy's article in the November issue of **Apple Orchard** ("A Comparison of Programming Languages Available for the Apple II") was interesting, but his article left out one of the most powerful, fast; and the original programming language for the Apple II, *Integer BASIC*. The listing that follows is the same style of code which was used for comparison:

```
10 REM * PRIME FACTOR *
20 REM
30 REM THIS PROGRAM DETERMINES THE
40 REM PRIME FACTORS OF AN INTEGER
50 REM
70 Z=0:S=0:I=0
80 GOTO 4000: REM MAIN
1000 REM DISPLAY
1010 IF S=0 THEN 1050
1020 PRINT I;
1030 PRINT ",";
1040 PRINT S
1050 RETURN
2000 REM CALCULATE
2005 X=Z
2010 FOR I=2 TO X
2020 S=0
2030 IF Z MOD I<>0 THEN 2040
2035 Z=Z/I:S=S+1: GOTO 2030
2040 GOSUB 1000: REM DISPLAY
2050 NEXT I
2060 RETURN
3000 REM NUM
3010 PRINT
3020 PRINT "NUMBER: ";
3030 INPUT "",Z
3040 IF Z=0 THEN 3070
3050 GOSUB 2000: REM CALC
3060 GOTO 3010
3070 RETURN
4000 REM MAIN
4010 CALL -936
```

```
4020 PRINT "PRIME FACTOR ROUTINE"
4030 PRINT "ENTER A ZERO TO END"
4040 GOSUB 3000: REM NUM
4050 PRINT
4060 PRINT
4070 PRINT "GOODBYE"
4080 END
32700 REM INTEGER BASIC VERSION
32710 REM SAME FORMAT AS PROGRAMS
IN NOVEMBER '83 APPLE ORCHARD
32720 REM BY PHILIP CHIEN
```

Line 2030 uses one of the functions available in *Integer*, but not in *Applesoft*. MOD (MOD calculates the remainder of a division), and line 4010 uses CALL -936 instead of HOME.

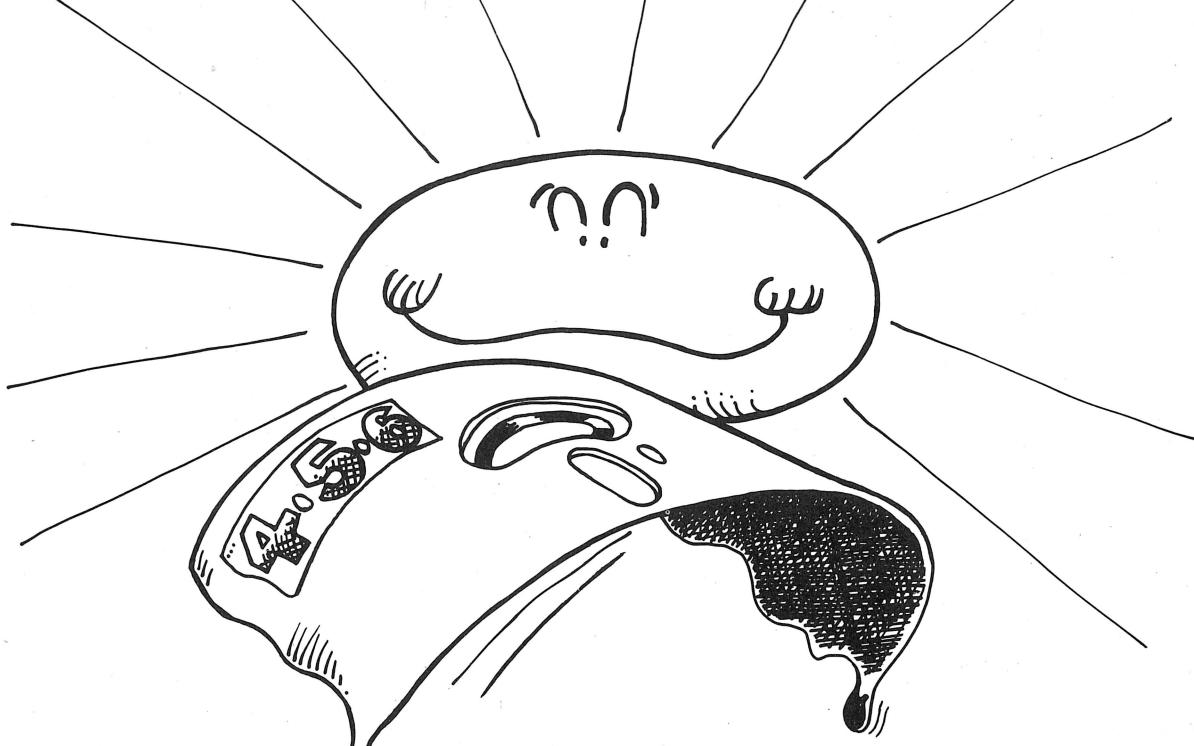
Not surprisingly, when PRIME FACTOR is run in Integer it out performs all of the interpreted languages. It takes twelve seconds to calculate the prime factors for one thousand. Should the program be compiled, I'm certain it would surpass the speed of all of the compilers also.

However, I still feel the *Integer BASIC* is a very powerful, sophisticated language for many applications. It is very memory efficient (no garbage collection needed whatsoever), fast, bug free (at last count three bugs have been found, vs. the dozens in *Pascal*, and hundreds in *Applesoft*), and not surprisingly, it is the only language for the Apple written by Steve Wozniak, and the only language written totally within Apple Computer, instead of licensed from a third party publisher.

Whenever I write utilities, either quick and dirty, or sophisticated, I use *Integer BASIC*. If I need more powerful number calculations and disk operations, I use *Pascal*. The only times I'll even touch *Applesoft* is when a customer demands it.

Its a pity the Apple Computer, with implementation of *PRO-DOS*, is cancelling support for this excellent language.

— Philip Chien, Brooklyn, NY



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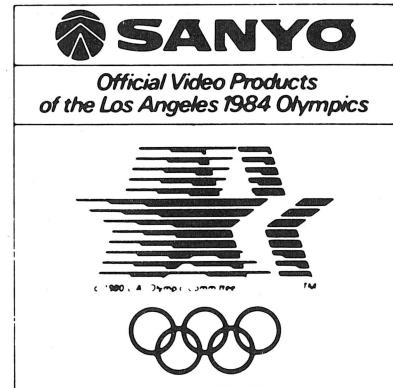
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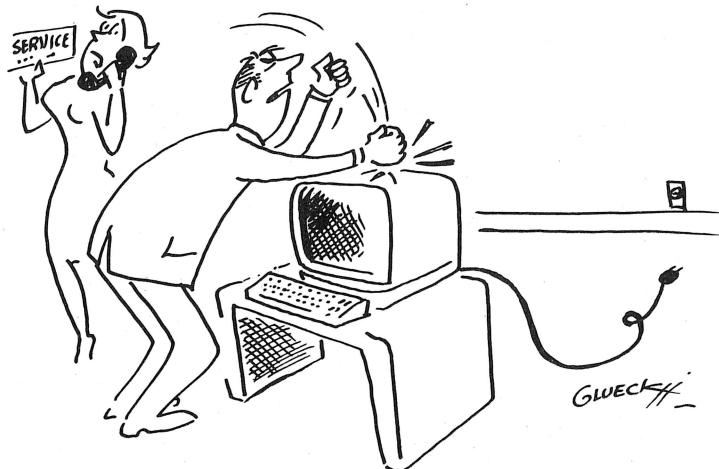
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The switch settings given in the Imagewriter manual are incorrect. A serial interface can either be set for seven-bit or eight-bit transfer. Seven-bit transfer is faster by something like 12 per cent, so if the eighth bit is not needed (that is, if no more than 128 characters are to be transmitted), a manufacturer will go to seven-bit transmission. The manual writers aren't always told of this, however. The switches in the Imagewriter and on the Super Serial Card should be set for 7-bit transmission, not 8-bit transmission.

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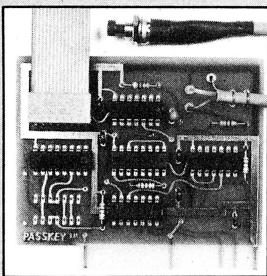
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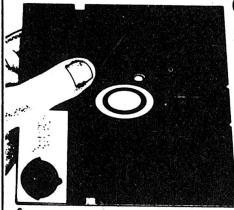
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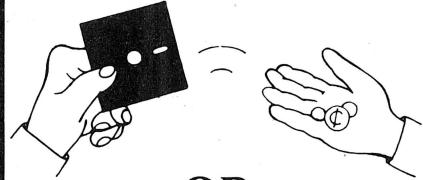
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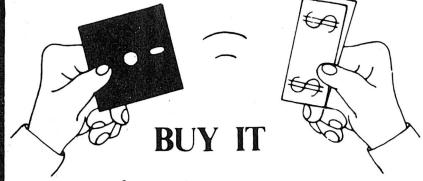
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Spellbinder

Review
by
Woody Liswood

Published by:
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SPELLBINDER is a word processor with enough "bells and whistles" to bring warmth to the heart of the coldest typist. Those accoutrements cause the Spellbinder folks to call their program an office management system rather than a word processor. Well, it is their program, so they can call it anything they like.

When you look at word processors, it is almost accepted practice to compare whatever program you are using to WordStar. Well, in this case, I suppose that it would be appropriate to compare WordStar to Spellbinder. In a feature by feature comparison, Spellbinder has more features than WordStar. These extra features arise because Spellbinder has a special Macro language and comes supplied with a series of macros which add many special processing features to the word processing program. In an ease of use comparison, Spellbinder for the most part is just as good (or complicated) as WordStar. Folks who also use Spellbinder have given me a good argument that Spellbinder is easier to learn than WordStar. However, when I learned it, Spellbinder seemed just as complicated as WordStar given the advanced things I would normally want to put a word processor through. At least that is my current opinion.

However, word processors are like cars, try it, you might like it. Then again, you might not. All I can say is that in my opinion Spellbinder will probably do everything you might need in your word processor.

The most obvious difference between the two programs is that WordStar is a what-you-see-on-the-screen-is-what-you-get-on-the-paper type of program. Spellbinder is not. It is a "text editor" which uses all 80 columns of the screen to place the text while you are typing. If you want to see how it looks before you actually print your material, Spellbinder has a "view" mode to allow you to preview the text before it is printed.

If you would like a "true confession" type of review, this will be a good one. I am having considerable difficulty in making up my mind whether or not to switch from WordStar to Spellbinder. The problem revolves around proportional spacing. Spellbinder has it, WordStar does not. I still think that WordStar is easier to use during editing because you can find a word on the screen at the same place it is on the document. With Spellbinder, you must find the word in the text sequence. Experienced users use the search and find feature of both programs to find places in the text, so this may not be too much of a problem, still . . .

Let's spend some time on this problem. Spellbinder uses various tables to set up for printing. One of these tables is called a "Y" table. This table controls, among other things, whether or not Spellbinder will do proportional printing. If you have a printer capable of doing proportional printing, then you can set that default to "Yes", and your output will look like it was typeset rather than typed on a typewriter. In fact, I think Spellbinder has the best way of doing this that I have yet run across. It controls the print-head of the daisy wheel printer directly. So, you don't have to have a proportional spaced wheel with unusual placement of characters. You just tell Spellbinder that you have a "precision printer" and the program does the rest. If, at first glance, you do not like the way the letters are spaced you can call in a tab file, change the spacing characteristics (there are instructions in the manual to do this) and then go to command mode, type "PS" and Spellbinder then installs those as new spacing guides. If they work, you can make them permanent defaults by exiting the program, then saving it back to disk. When saved this way, your new spacing table becomes standard defaults.

If you do lots of printing, as I do, the proportional spacing makes the switch from WordStar a given. However, there are some problems. I use two (or more) different computers. Spellbinder has a bug in how it handles enhanced text on my portable so I wind up with somewhat different files when transferring them between the Apple and the Escort and back. Here is the bug. Spellbinder uses a Control-W to highlight words which should have something special done to

them during printing. On most computers, the enhancement shows as inverse text. This is how words get underlined, boldfaced, struck over, and whatnot. Since Spellbinder uses a table to say what the enhancement character is to be, you can not have boldfaced and underlined text at the same time. That, to me, is a minor problem, but one that should not exist in a sophisticated word processor. However, on my portable, I must use the tilde before and after the word(s) I wish to have enhanced. That's because the Escort has a non-standard method of creating inverse text which does not work well with Spellbinder. That feature is also available on the Apple. However, Spellbinder when printing and coming across a tilde in the last word of a line, forgets where it is and turns off the feature before you want it to, then comes across another tilde which you meant to end the enhancement and now Spellbinder turns it back on. *That is a Major Bug.*

Another problem I found with Spellbinder is in creating mailing labels. The documentation gave instructions which did not work. For some reason, I was unable to get a 5 or 6 line label formatted. A call to the Spellbinder folks brought me a solution. They gave me a patch to apply using DDT so that I could have mailing labels. *That, to me, is another problem.*

The Program Itself

Other than the problems mentioned above, the program is a dream. It has all of the editing features which you might ever need. On my Apple, I used the Videx function strip to encode the most typical Spellbinder commands. That way I had my direction arrows all easy to get to. In addition, I set the function keys up to be able to go from place to place within the file with ease.

Edit Mode

Spellbinder works with four modes. First is the Edit mode. In the Edit mode you can enter text, type over text, and change text as much as you wish. Within the Edit mode, you can move your cursor a letter, sentence, paragraph, or mark to mark, at a time. You can also delete using the same modes. The program normally stays with the word mode. When you change it and delete, say a sentence, the next key you hit sends the mode back to word.

In the Edit mode you can have indents, decimal tabs, various types of hyphens (soft and hard) and other assorted goodies. For example, Control-R starts a repeat function. The next character you press will be repeated until you hit the key a second time.

Control-X places a mark in your file so that you can use it as a special place or for block functions or for finding your place rather quickly.

Control-W will turn characters between two Control-Ws into enhanced characters. This can also be accomplished by using a tilde character. Now for a problem: Spellbinder can not have more than one enhancement working at one time. So if you want underlined and boldfaced letters you can't have them, at least according to the manual. However, Dave Arnold, a writer and a friend, told me a way around the problem. You should use your enhancement to do the boldface. Then you would start the next line with a .B which will cause your printer to back up one line. (assuming you have a printer with that capability). Then you print a mask with spaces and underlines. Spellbinder will then put the underlines where

you want them. Thanks, Dave. However, you must only add the underlines after your final edit of your file. If you create that mask, then edit your file and change any spacing in the text prior to your mask, you will have to redo that mask. A real pain, but one way around the limitation.

Control-T rewrites your screen and places the line in which the cursor was on at the top of the screen.

This brings up another feature of Spellbinder. It always tries to have the cursor moving at the middle of the screen. It is continually moving text around as your typing adds text to the screen so that you will be in the middle of the screen. To me that is rather distracting, but in all fairness, other people who I have talked with say that they really like that feature.

Spellbinder works with a mode-key. A prompt line shows the current status of the program. When you press a Control-O the mode changes from Word, to Sentence, to Paragraph, to Mark and back again. Then, depending on the key you press, you will go forward or backward by the mode indication. That indication also allows you to delete text according to the mode.

You can also move forward or backward a screen at a time using a Control-G to go back a screen and a Control-V to go forward a screen.

Escape

Another mode is the Escape mode. This is similar to the movement commands which are generated with control characters. And, you will also see that some of the Escape functions are repeated in the Command Mode. Spellbinder gives you a variety of ways to accomplish things so that you do not have to change modes just to get to the function you need at the moment.

ESC-T	gets you to the top of the file.
ESC-E	finds the bottom of the file.
ESC-C	places the cursor and associated text at the center of your screen.
ESC-F	goes forward to the next mark.
ESC-B	goes backward to a previous mark
ESC-N	goes forward one screen page.
ESC-P	goes backward one screen page.
ESC-R	rewrites the screen and places the cursor at the top of your screen.
ESC-I	clears any indents you may have started with a Control-Y
ESC-H	takes the text between your cursor and the next mark and places it into a holding buffer.
ESC-U	writes the text stored in the holding buffer into your file starting with the cursor location.
ESC-TAB	puts an absolute horizontal tab into your document for controlling the printer.
ESC-ESC	will show the status line (mode, place) if you installed Spellbinder to not display those items continuously at the top of the screen.

You make a mistake and need to add some other words. If they fit, you can type them over. If not, you switch to Insert mode.

Insert Mode

In Insert mode, the text to the right of the cursor is pushed down to the bottom of the page and you are given a window to start typing in. As long as you stay on the same line you can treat everything as if you were in the Edit mode. However, if you make a mistake and want to go back one line, you first must exit the Insert mode, then move your cursor to where you want to make the correction, and then take whatever action is necessary. It is somewhat awkward to remember all of this and can get to be somewhat frustrating if you are making lots of changes and editing as you go along.

If you do not want to edit or insert, then you probably have some sort of command to give the system. That is the next mode, the Command mode. From here you can do lots of things.

Command Mode

The Command mode has so many functions and abilities that it is really the meat of the program.

The documentation points out that many of the Command mode commands can be used with numbers to indicate on how many lines of text the command is to be carried out. When you are in command mode, you cannot do anything with your text.

B moves you to the start of text or to a previous mark if you have used marks. A B5 moves you back 5 lines.

D will delete from the cursor to 1024 characters. If you have more than the 1024 characters, Spellbinder will ask you if you really want to delete and you must respond with a Y. If you type DA you are saying to Delete All of the text. A D50 would delete 50 lines.

Hitting E moves to the end of the text.

Pressing F moves forward. By itself it moves to the end of the text. With a 10 would move forward 10 lines.

Hitting FF sends a formfeed command to the printer.

FY or a FT fetches the Y or T tables for editing. More about those later.

Spellbinder uses W and G commands to get text from the disk and write text back to the disk.

A G with a file name gets that file from the disk and installs it into the workspace. If the file is greater than the workspace, you must specify the name of the file which you want the text written to during the edit process. A / will tell Spellbinder to use the same name. Then, as you work your way through the file and reach the end of your text, you would switch to the command mode, press G and the old workspace is written to the disk and another section of your file is read in from disk. I find this feature adequate for most use but it does mean that you can not edit your entire file at one time. You cannot go back to the start of your file if you have already written that portion to the disk.

Q will display the space used on your disk as well as the directory for that disk. A QD plus a file name will delete that file from the disk.

R reads in text from a disk file and places it at the cursor. An R10 would read in 10 lines from a file and place it at the back of the current workspace. An RI would read in a text from the disk and place it at the cursor.

S starts the search function. You will be prompted for the appropriate strings and replacement text if necessary. There are a number of special types of searches you can do. Here is one example of how I use the search function in a different way than normal.

When I want to do proportional printing and use a file I created with WordStar, I go through a series of moves rather than purchase a \$100 program to do the same things. First, I turn off the justification feature of WordStar and reform the entire file. Then I PIP the WordStar file using a [Z] extension which sets the "high bit" to zero. Then I read the file with Spellbinder. I now have a file with a carriage return at the end of each line. I key in the following SG/ << / and Spellbinder removes all of the extra carriage returns and replaces them with a space. It works fine. What I said was to do a global search for two spaces followed by a << (the << indicates a carriage return to Spellbinder) and replace it with a space.

V will verify and display the file, on the screen, so that it will look like it will when it is printed.

Pressing a L will tell you the length of your screen display line. Pressing a L50 will change the screen display to a 50 column display.

X will exit back to CPM.

Z will allow you to change the tab tables.

M will display how much memory is left in the work space.

A will allow you to run macros which come with the program.

Tables

Keying a Y will get you to some of the special tables which control the program and how it works with the printer and handles titles and other such goodies.

Spellbinder has a variety of special tables which you must use to control many of the special features. The most frequently used is the "Y" table. This table controls how Spellbinder utilizes your printer. There are actually two of these Y tables. I set up one of them to work without turning on proportional printing and the other one to support a Diablo 630 printer as a proportional printer.

The table looks like this:

Printer Type
Destination
Print Routine
Print Length
Form Length
Page Eject
Left Indent
Spacing
Justification
Line Width
Line Feed
Character Size
Special Char
Proportional
Maximum Space
Minimum Space

For the most part, those headings are obvious. You move a cursor up and down the table with the arrow keys. When the

cursor is on a particular item, a list of possible responses is provided to the right of the table item. Those responses are numbered and all you need to do is key in the appropriate number. The last group, however, deserve some special comments. Setting the character size tells Spellbinder what pitch you are using or notifies it that there will be a special character width table for use with proportional printing.

Setting the Special Character tells Spellbinder what to do when it encounters a enhance character mode when printing the text. There are a series of special enhancement modes.

0. Shadow Print
1. Underline
2. / overstrike
3. - overstrike
4. Boldface
5. Skip
6. Ignore enhancements.

I normally leave the special enhancement set to Boldface.

The maximum and minimum tell Spellbinder the maximum and minimum space to allow between words when it forms a line for printing.

Titles

The other table which many use is the Title table. This controls the placement of page numbers, titles and other goodies.

- Top Title
- Top Spacing
- Bottom Title
- Bottom Spacing
- Odd Page Format
- Even Page Format
- Page Number
- Odd Page Margin
- Even Page Margin
- Top Margin

Both of the tables can be inserted through out your text to change these variables whenever you need them. They appear as a special form of a dot command.

. Y 1 90 110 2 0 1 1 65 2 10 0 1 35 5

This is the normal setup for proportional printing which I contain in the Y table. I placed it here in the manuscript of this text by changing to command mode and keying a FY for fetch the Y table. Then I added the double quote to the front of that line so that Spellbinder would not intrepret this as a dot command.

Spellbinder has dot commands as well as the other special ways to insert commands into the text.

DOT Commands

- .C centers text
- .H identifies a header
- .E inserts a formfeed
- .B inserts a negative line feed
- .R inserts a non-printing comment
- .S print terminator
- .T vertical tab
- .Y changes the Y table
- .YS changes to an alternative Y table
- .YT changes the T or title table.

Spellbinder also allows use of a series of special commands inserted during normal text entry. There are a variety of these commands and seem to be best suited for use of the macro commands rather than as regular parts of my normal word processing activities.

Macros

There is a number of word processing macros which come with the program. These give Spellbinder many abilities not found with other word processors. These files are run through the command mode.

Here are the macros which came with the program:

LINENB numbers each line of a file to correspond to the line numbers displayed on the prompt line of the screen. This way, you can edit or discuss a document sent to someone using the line number rather than trying to find page, paragraph, then word for discussing documents.

FORMS gives you a formfill and generation capability using mathematics and other files to get information. For example, you might set up an invoice, fill it in, allow Spellbinder to calculate the totals then print the invoice. This macro works by saving each of the forms you create and fill in to a normal text file which you would print using the normal print commands.

BOILER allows you to save boilerplate text in a special file. Each of your paragraphs is numbered. You would then create a document by specifying which paragraph you wanted to print and in what order.

BATCH allows you to print a series of files. You create a standard text file with the names of the files you wish to print and batch then prints those files in the order you specified.

2CPRT prints your text in two columns on one page. This is a useful file if you are "typesetting" newsletters or magazines on your own printer. There are some things you should watch out for. You should not use any special print enhancements because they will carry out over the entire page rather than just the portion of the page which contains the correct column. It is also rather slow and only works a page at a time. That is probably a small tradeoff for that ability, but I got rather frustrated that when printing a lengthy file I had to sit with the computer and the printer during the entire time.

CUESORT sorts a file which you have created. It works rather slowly but it does work. Its most common use would be to sort mail merge NAD files.

MMERGE prints a letter inserting names and addresses from a NAD list. The address list was created following special instructions found in that macro section. It does not use a standard comma delimited ASCII file. I did not try to move files from Selector, WordStar or dBase over to try to get them to work. The instructions in the documentation was very specific in the format which must be used to get this macro to work. I did a small data base of around 100 names and address and used it to mail a advertising flyer to those folks. The feature does work.

LPHA is another sorting and selection macro which will work with those special NAD lists.

MOVEIT gives you a column editing and moving capability.

ADDIT is one of the better macros. It allows you to add, subtract, multiply or divide numbers as your are creating your document. It works with rows and columns as well as with individual numbers. I found this a fascinating part of the program one of the most useful features.

KPHRASE allows you to describe a series of special phrases and assign numbers to them. Then, as you create your document, when you want one of those special phrases in your text you only key in the number and KPHRASE will insert it for you.

CALC operates Spellbinder as a calculator and uses registers and a text display according to the documentation. This was the only MACRO I never tried.

One thing to remember about the macros is that you can only use one at a time. For example, if you want the math available you can not have the key phrase macro on-line.

There are instructions on creating your own macro. I found them to be gibberish. They don't make sense. A call to the Spellbinder folks got me the information that they will have a special macro language program with special instructions at some time in the future.

Documentation

The documentation came in a three ring binder. It was adequate. It covered the major operations of the program, but did not go into great detail on any of advanced uses. However, Spellbinder is so easy to use that I was able to figure most of the features without special help. I would plan on a few phone calls when you get to the complicated macros.

The documentation lacks an index.

In addition, there is a separate book supplied called "Spellbinding Made Easy." It is a step by step tutorial of the basics of the program. It works and makes some sense. You will want to start with that when you purchase the program.

For Apple Users

If you use an Apple, Spellbinder suggests that you modify the BIOS so that you can make use of all the control characters and special commands which are necessary. The modification is relatively easy.

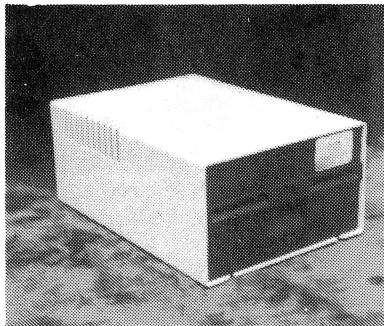
Telecommunication

There is a problem with transmitting text files created with Spellbinder. Each paragraph is contained within a carriage return and a linefeed. If you transmit to some systems, you will be required to have a Carriage Return Line Feed combination every 120 characters or so. You can't send the files as they are normally stored. You would load the file and write the file back to disk with a /1 after the write file name so that Spellbinder would place a carriage return after each screen line. This is somewhat awkward, but it is a solution. Just thought you should know.

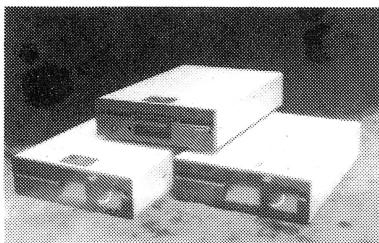
Conclusion

A good program. If you have a printer capable of proportional spacing, then you should consider Spellbinder as a potential word processor. If you think that all those macros would make your life easier, then you will love Spellbinder. I like WordStar for the what-you-see-is-what-you-get editing and Spellbinder for the printing and the macro file capabilities. I currently use both.

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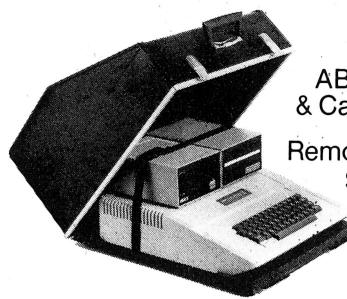
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Circle HelpCard No. 21

Diagnosing And Repairing Your Apple II Or Franklin

Part 2

by Neil D. Lipson, P. E.

Part One of this article appeared in **Apple Orchard** for February 1983 (Vol.4, No.1). It was only a two-page article, and I didn't think all that much of it. But the response that it got from readers was nothing short of overwhelming. It seems that we have hit on a popular point with Apple owners. So, I am going to pick up where I left off, and go even deeper into many areas that were not covered, including compatibility problems with software. Please read this carefully, as it will save you countless hours.

Printer Problems - letter quality printers

Did you ever use your Diablo or other letter quality printer, and suddenly without warning the overflow light went on? If it does it sporadically, it is probably static electricity. The same thing applies to the printer giving double characters, extra characters, and unusual tabbing: it's almost certainly static. Why letter quality printers are more sensitive, I don't know, but they are. The static may be from the room or through the electrical cord, but it is usually from the immediate area. However, I have seen static travel through the power cord in many situations. A good way to determine this is to start printing and then leave the room. If the problems diminish, static is likely to be the problem. If the printer acts up when you touch it, is another good indicator. The solution is to use both a static mat *and* a touch mat if it is a serious problem. These problems can and usually do occur 12 months of the year. Even during the winter, the air conditioners remove humidity from the air, which aggravates a static situation.

Sheet feeder problems are almost always either a software problem or wrong switch settings. Sometimes you will get a drift in the formfeed, and this indicates an open wire in the connection between the sheet feeder and the printer. Also, remember to feed a blank sheet through first to clear the error light.

Disk Controller Card Problems

There are some programs that will not work with disk controller cards other than Apple's. A few examples are Super Expander from Omega Microware, and some protected software like the old Wizardry. Apple still considers its Disk II control circuitry to be proprietary, and its protocols consider only the Apple controller card. Which means that if you're not using an Apple disk drive or controller card, Apple guarantees nothing — except that with new software (such as ProDOS), it was not tested with anything but an Apple card and drives.

Most of the other controller cards and drives work, most of the time. You will have to check and be sure in your application. If you try to put an extended switch on the Lobo card to switch from 3.2 to 3.3, it may not work at all. I suspect capacitance, but I am not certain. However, I have seen this problem at least a dozen times. The Franklin controller card, (as well as the MicroSci) have potentiometers on them that sometimes drift. They rarely need adjustment, but every so often they do.

Disk Drive Repairs

A squeaking drive usually harbors a dirty pressure pad; every so often, it is the drive motor. These are usually sealed, but I once put a small drop of oil in the bearing of the motor and the noise went away, however, this is really a job for a qualified repairman. When replacing a dirty pad, be careful not to push at all on the read/write head. Even the slightest pressure can knock the drive out of alignment. Also, don't let the pad "snap" back and hit the head when you are finished replacing it. Head cleaners are rarely needed. I never clean mine, and my drives get quite a bit of use. Use good diskettes, however.

One word of advice. Ground your disk drive. The original Apple drives have no ground wire, which means when you touch it, the surge will go through the case to the read/write

head and into the circuitry and burn out something there. Put a ground wire on the bottom of the drive.

Disk Drive Repairs (for experts)

Many of you thought that I would be afraid to discuss this next section. Well, I will go into all the gory details, but neither myself, **Apple Orchard**, or the IAC will be responsible for any mistakes you make (The disclaimer is located at the end of this article which you must sign first before reading it) (*No it isn't; but it is understood that when you bought this magazine you forfeited all your rights to . . . aww, forget it!*—PCW). This is really for an experienced technician, but many of you will find this section interesting.

There are six items that need attention when adjusting drives and drive cards for the Apple, and seven if you have a Franklin. They are:

1. Azimuth
2. Track Alignment (Radial)
3. Zero Detent
4. Write Current
5. Disk Speed
6. Read/Write verify
7. Controller current (Franklin only)

You will need the following:

- A. Computer and monitor
- B. Drive and card
- C. Dual trace oscilloscope with 2 probes
- D. Speed diagnostic diskette or strobe light (neon)
- E. Alignment diskette (Dysan 208/10 or equivalent)
- F. Blank diskette
- G. Digital Voltmeter

Azimuth Test

I have tried this on a Franklin drive, and will describe it here. The procedure should be almost identical for the Apple. If the head azimuth is off, it must be repaired at the factory. Only the manufacturer can correct this, and they usually just replace the head assembly anyway.

1. Attach the probes to the rear leads of L3 and L4 on the Franklin card and attach the ground on the right lead of C14.
2. Run the Azimuth test (the dealer diagnostic is needed for the Franklin version).
3. Sync the scope and look at the wave form. It should look like the pattern below. If any of the outside bands are wider than the inside, the head is damaged.

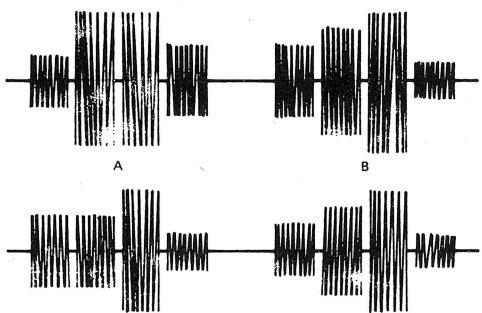


Diagram #1
ACE 10 Floppy Disk Azimuth Test.

Radial Alignment

This test was also done on the Franklin, but again should be similar on the Apple.

1. Run the alignment program by using the Dysan diskette.
2. Hit the / key which puts the head on track 10 of the alignment diskette.
3. The scope probes stay on the same location as the azimuth test. Adjust the scope to a time base of 10 msec/division.
4. Sync the scope and look at the pattern. Both lobes should be the same amplitude. If not, loosen the stepper motor screws and rotate either right or left until both are the same.
5. See the diagrams below for examples.

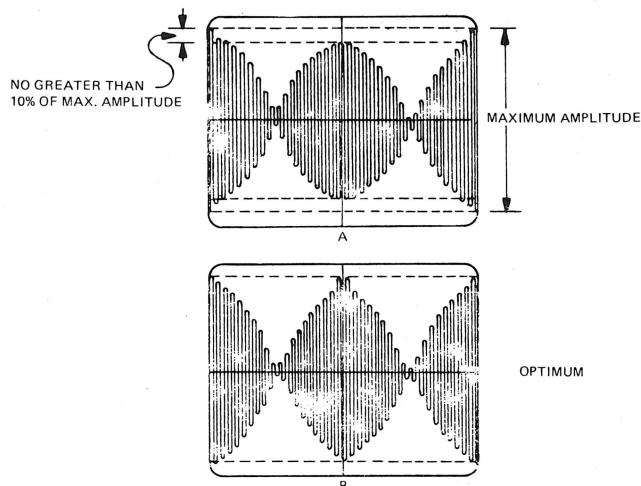


Diagram #2
Disk Radial Alignment

Zero Detent

1. Unscrew the analog card on the top of the drive, unplug the cables and put it aside.
2. Carefully rotate the head cam actuator until the zero detent hole is as shown in the below diagram.
3. The carriage limiter and the motor shaft should be touching at this point.
4. If necessary, loosen the adjustment screw to the right front of the read/write head and adjust accordingly.

You usually need a zero detent adjustment if the drive will catalog fine, but cannot boot any diskette. Don't make this adjustment on a random basis. Know what you are doing or don't do anything at all.

Write Current Adjustment

I personally did this adjustment on the MicroSci drive which is identical to the Franklin drive, so the procedure for other drives may be similar.

1. Short both the 13 and 16 sector tabs on the MicroSci controller card. One side is already jumpered. You can place a small screw on the other two tabs, but be careful that the screw does not jump out and short out something on the motherboard.
2. Ground an accurate voltmeter on the negative end of capacitor C-14 on the analog board.
3. Turn on the computer and it will come up into regular Applesoft. The drive will not boot in this case.
4. Type in the following:

- A. CALL 50688, <RETURN>
- B. <R>, return
- C. <AAW>, return

5. Put the probe of the voltmeter on pin 3 of integrated circuit U1 (number CA3054) on the disk analog card.
6. Adjust the blue potentiometer to 1.24 volts. Do not exceed 1.24 volts, and it is better to be under than over.

Drive Speed Motor

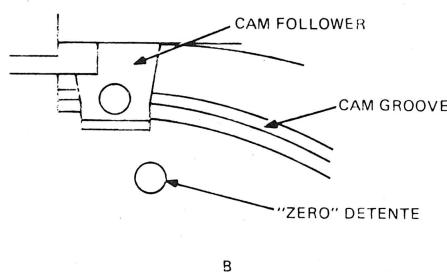
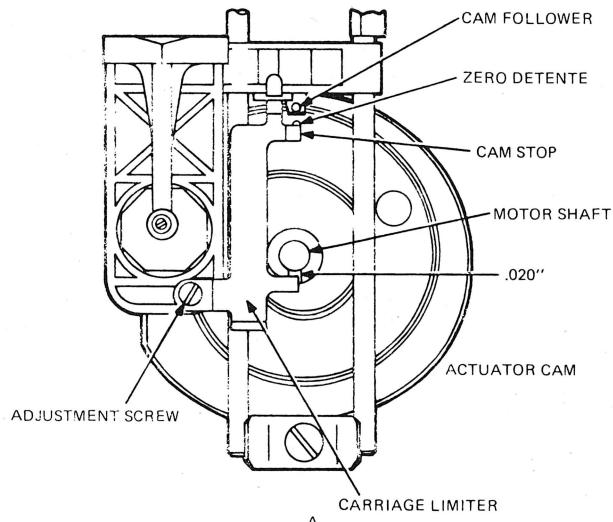


Diagram #3

Track Zero Detent/Carriage Limit Adjustment

I have heard many complaints from all the drive speed programs around. Locksmith has one, but it gives a different speed than Discotech, which gives a different speed than the Apple diagnostics. Also, the MicroSci controller needs a different speed adjustment than an Apple controller. What do you do? Easy.

1. Get a small neon lamp on a normal 120V, 60 Hz circuit.

2. Remove the drive case and turn the drive on the side to see the drive motor underneath.
3. Boot the drive with no diskette in it.
4. There is a small adjustment screw on the back of the drive. This is on the drive card (not the analog card on the top). The pot is usually a long pot with a small screw coming out to the side on the right of the drive.
5. Adjust this until the 60 Hz bands are stationary. Use a pen as a marker to hold next to the bands to see any movement. The bands may move slightly back and forth, but the average should keep the band in one relative position. This will work on almost any drive, except hard disk drives. You need no program or special equipment other than a cheap neon light for the strobe. This is the best way, better than any program I have ever used. It does require a little more work, but it guarantees results.

The drive speed adjustment is by far the most frequent adjustment necessary for drives, and even the entire computer. As the drive gets older, the speed gradually increases (it breaks in, and there is less friction). The experts adjust it a little to the slow side because they know it will speed up eventually. Also, use the brand of diskette that you normally use. If you use Maxells, then use a Maxell when adjusting the speed. Yes, different disks have different levels of friction. Although every disk manufacturer will deny this, that friction level also will vary a bit from lot to lot from the same manufacturer. These are fine points, but you never know what small variances may cause problems later.

Peripheral Card Incompatibilities

I undertook a consulting assignment for the law firm of Cohen, Shapiro, Polisher, Shiekman and Cohen in Philadelphia. They use their Apples and Franklins for about every imaginable use that I have ever seen. They were running expanded VisiCalc, character fonts and more. Well, I did find a few incompatibilities, which I'll list here. If you found some, let us know.

The Ramex 128K card is almost identical to the Saturn 128K card, but not quite. Everything will work perfectly on both cards, except that the Super Expander Plus will not work well with the Saturn. It will load and seem OK, except data will occasionally be garbled. It appears that the cards are slightly different, but it took a massive investigation to find this out. The errors were not consistent, so this complicated matters. Many times it worked perfectly, but would eventually act up.

Another client tried to print from dBASE, and the system hung. Eventually, we found the problem: the Franklin 80 column card in the Franklin Ace was somewhat incompatible. When a Videx 80-column card was inserted, the problem went away. I was also told that the SSM AIO printer card does not work perfectly with dBASE. Who would ever think that an 80 column card would interfere with printing? Well, it did!

Many programs will not work properly with the Saturn Accelerator unless you disable it. Zaxxon and Kraft Quik-Vis will not work in the speed mode. It is fairly easy to disable the software, but ya gotta do it, or else.

Diversi-DOS disables many of the features in some of the fancy printer cards, such as the PKASO card from Interactive Structures, when you use the print buffer mode. If you use the buffer on a Diablo, you must first turn off the Diablo line feed at the printer, otherwise you will get a double line feed.

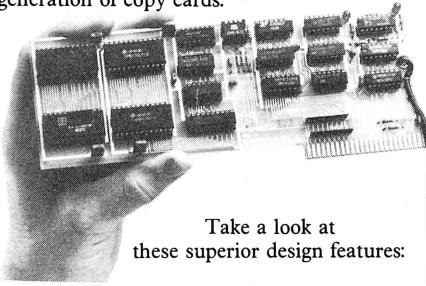
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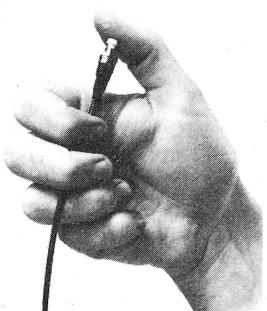
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Some of the PKASO cards that work perfectly will give a problem on the Apple ///. This is usually a capacitor that Interactive Structures will fix, as it was causing a timing problem.

Voltage Surges and Lightning

Voltage surges can be prevented to a large degree with a cheap surge protector or thyristor. The thyristor costs only \$3, but some companies charge \$30 for the entire plug. Save some money and make your own. Put the thyristor across the voltage terminals, and it will clip the voltages above normal. The part number on this is General Electric V130LA20A-X6 or 62C5-1-J6. There are hundreds of others that will do the same job, however I had these numbers handy so of course you can get an equivalent.

Warning: don't play with 115-volt AC household wires unless you know what you are doing; that voltage is dangerous, and we don't want to lose any subscribers.

Lightning (which is also dangerous) must be handled in a different manner. You need two devices. The first is a two pole switch to disconnect *both sides* of the incoming power. This is where most people make a mistake. A normal switch only disconnects the "hot" side of the power. However, with the tremendous surge that lightning has, you can get a potential voltage across the ground and neutral. This normally never happens, but during a lightning storm it can and does happen. A two pole switch will disconnect *all* the wires, so no current can get through.

By the way, never open the ground wire. Your computer has a three-prong plug. If you have an ungrounded socket, *Do Not* use an adapter with the third wire dangling in mid-air. This should always be attached, especially when plugging and unplugging cards. Of course, the power switch must be off, but the computer should be grounded regardless. Static is the reason.

If a storm approaches, turn off the computer with your new switch, or if you have a regular one, *pull the plug* and wait until the storm passes completely. When you go on vacation, pull the plug. You never know what will happen while you are away. Also, pull the plug on the modem input. Lightning will try to get through the phone lines too, and few if any people realize it. I only thought of this a month ago, and no one else has ever mentioned it.

Video Flicker or Loss of Video

The biggest cause of video problems is a faulty cable between the monitor and computer. This is 95% the case! Do not use a cheap phono cable, as this cable is designed for audio use. Get the best you can buy. The image will be clearer and brighter, with fewer ghosts. I found this by trial and error (it occurred while writing this article, as always). I will discuss computer video problems a little later.

Magnetic Flux Problems

Keep the monitor *away from the disk drives*. The monitor generates magnetic currents which can cause your disks to hiccup and die. It doesn't make any difference what type of computer it is, or the type of drive, but it can create a problem. The Zenith monitor is especially susceptible to this, and the Apple /// is really a problem here. Oh: and don't put disks on top of or alongside the monitor.

To determine what kind of problem you might have, use the phone trick. Hit a 1 on the phone to kill the dial tone. Then move the phone around the computer. You will hear a hum near the monitor. If you hear any other hums, these are causing magnetic flux, so you must move them away from the drive and diskettes. The phone itself can create a great flux if it rings, so keep diskettes away from it also. Speakers and radios are also flux generators, especially loud speakers. Even small ones can do a number on your software.

Software Incompatibilities

I will cover as many as I can remember. WordStar is very fussy as to which type of serial card you use with the Diablo printer. The best is the CCS card, with the old Apple High Speed Serial card as a second. The Andromeda card does not always work properly with the 60K CP/M. This was discussed in other publications in detail. The Epson graphic programs for the old Epson MX-80 without Graftrax would not work properly on other printer cards. Most people don't have to worry about it, but there's always the chance.

PFS will sometimes put you into the 80-column mode even though the program is displayed on the 40 column screen. Plug the monitor into the 40 column jack, and you will see the program. To solve this, use a hard switch in addition to the soft switch and force the Apple video into the monitor.

Many fastload programs cause some problems. For example, Format II will act up with Diversi-DOS. When in doubt, try it on a normal DOS 3.3. Many of the Applesoft compilers do not always work on all programs. Some of the fast copy programs work only on certain drive cards, and many pre-boots are very fussy indeed. As was mentioned earlier, the Ramex preboot has trouble with the Rana controller card. Of course, PRO DOS does not work on many Apple compatible machines. At this writing, PRO DOS has not been released to the general public, but it is being used for some software products.

If you plan to use Microsoft BASIC on the PCPI card or the Franklin 80 CPU card, you must first boot up on their special disk and then try your Microsoft program. However, I am told that certain portions of the memory map are different, so some things may not work properly. Only time will tell what will give a problem.

Many software products can create a problem because of the protection schemes. You can minimize this by keeping your drive speed exact. It does drift from time to time and it usually increases, so watch it carefully. The problem is that because both of your drives usually drift up at the same rate, you may not know there is a problem until it is too late. Locksmith will work beautifully as long as both drives are the same speed, even if it is high. However, the disk may not boot on another system, or on the same one six months later after you have adjusted the drives.

One of the most unusual problems that really falls under no known category was a friend that had a drive way out of alignment. He initialized the disk with a HELLO program on drive one, and saved another program on drive two. When he catalogued the disk on drive one, only the first program showed on the catalog, and with the second drive, only the second showed. Disk alignment can do some very strange things, but fortunately it does not happen frequently.

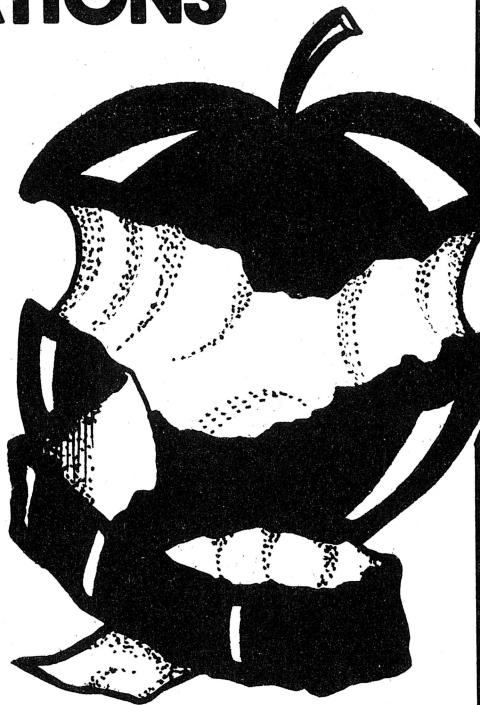
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guage portion tagged onto it. It will "erase" the machine language portion, and you will never know it. Don't boot a fast DOS disk on the SSD Flash Card disk emulator or the DOS will never work. You must patch DOS after the regular 3.3 boot has occurred.

Unfortunately there are millions of these, of which I have covered just a few. More will come; as we said, let us know of the ones you find.

Common Problems - General

With the Apple II Plus, it was found that failures fell into certain categories. Listed below are approximate areas of problems:

Circuit	Percent of Problem
Motherboard	25.5
Analog card	19.5
Power supply	15
Disk controller card	15
Disk mechanical	8
Keyboard	6
Ram card	6
Others	4

The Franklin Ace will have a smaller percentage due to the tremendous power supply and the fan, so the percentages will shift somewhat. The //e is very reliable, but there is little data on it (with respect to repairs) at this writing. One thing: we

have heard of some hot-running //e's. It's true that there are fewer chips on the motherboard. Some people have said that you don't need a fan for a //e. Well, if you're using a 128K card or other large card in your //e, get a fan for it.

In this article is a handy reference list of symptoms and their probable causes. This list was compiled from about seven different sources including my own personal experiences. It is fairly complete, and will be upgraded from time to time in **Apple Orchard**.

Conclusion (for now)

I have touched on a few more pertinent items that will help some of you in repairing your computer. I have gone out on a limb in assuming that most of you know what you are doing. I cannot stress enough that if you do not have a very clear idea of the above, you are taking a few chances and the repair bill can be quite a bit higher than if you just take it into the shop. However, if the store tells you that you need a new motherboard, what the heck, take the chance and try to fix it yourself. It is better than spending a few hundred dollars when the actual cost may only be a one dollar chip or less.

If any of you know of other problems for which you have found solutions and want the rest of the world to find out, please send the information to **Apple Orchard**, or to:

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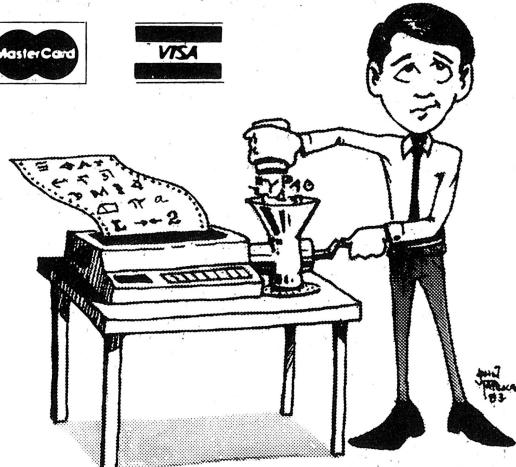
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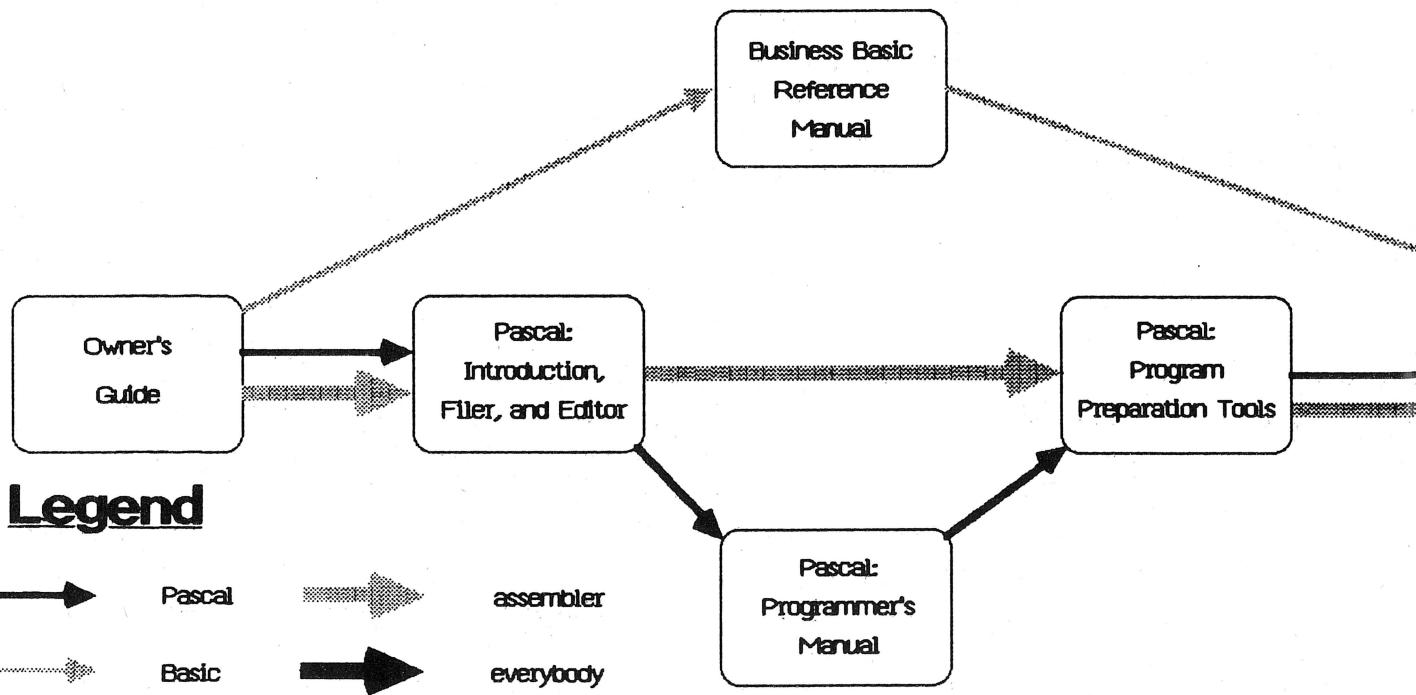
by Scott Knaster
and Alan Anderson

Trying to get information about programming the Apple /// over the past few years has often been pretty tricky. A big part of the problem was that most of the information was only available in pre-release, hard-to-get manuals. The *SOS Reference Manual* in particular had become something of legend, since it existed only in draft form, yet was constantly being used as a reference in magazine articles and even in other Apple manuals. Other "phantom" manuals which were often mentioned included the *Device Driver Writer's Guide* and the *Pascal Technical Reference Manual*.

Well, now there's good news for all us Apple /// hackers. All these manuals have been released by Apple in the past few months. These are not drafts, not preliminary versions, not "limited editions", but real-live, information-packed manuals that tell us just about everything we need to know to exploit all the features of the Apple /// and its operating system.

There's now so much stuff in all the Apple manuals that it's easy to be flooded by it all—quite a turnaround from the situation of the past couple of years. So, in the public interest, here's a guide to the available Apple /// documentation, where to find various items, what secrets can be learned in what books, what order they are best attacked in, and other miscellaneous fun stuff. As we go, we'll also develop a map to the Apple /// manuals: a flow chart (pardon the expression) of the order in which to read them.

The Apple /// is an extremely powerful computer. It has 256K RAM as standard equipment, an easy interface to a 5 megabyte hard disk, a real operating system that makes things like input/output and memory management remark-



ably easy, even from Assembly language, a large array of peripherals from the manufacturer, and now it's finally got the documentation necessary to tell software creators and hobbyists what they need to know. Let's take a look.

In the beginning

The basic Apple /// package comes with two manuals. Since everybody gets these, we'll take a look at them first. You might expect that these two manuals would be the most elementary and the least important for the advanced user. Well, as Johnny Carson might say to Ed McMahon, "Wrong again, buffalo-breath!" It's true that one book, the *Owner's Guide*, is a fundamental introduction to the computer; but the other book in the package is the *Standard Device Drivers Manual*, which does not exactly present elementary information for the novice user. In fact, the *Standard Device Drivers Manual* presents some of the most useful and advanced information available on various SOS driver features, and we'll talk more about it in a while.

The *Owner's Guide* is useful as an introduction to the Apple///. It talks about how the /// hardware is organized and gives some fundamentals about SOS, such as its hierarchical (a fifteen dollar word for "tree-like") file structure, using sub-directories to keep files grouped together. It also documents the Apple/// System Utilities program, which is used to copy files, format disks, make subdirectories, and do other general housekeeping. If you've never used a /// before, this book can be helpful. However, it's main audience is not programmers, and it only hints at how to use the machine's power when programming. We'll put the *Owner's Guide* first on our map of manuals.

Time out to go off on a small tangent: those of you with inquiring minds are no doubt wondering about the presence of the *Standard Device Drivers Manual* in the basic package. If it's really for advanced users, how come everybody gets one? The main reason appears to be that in addition to telling how the standard device drivers work, this manual also explains how to use one of the programs on the System Utilities

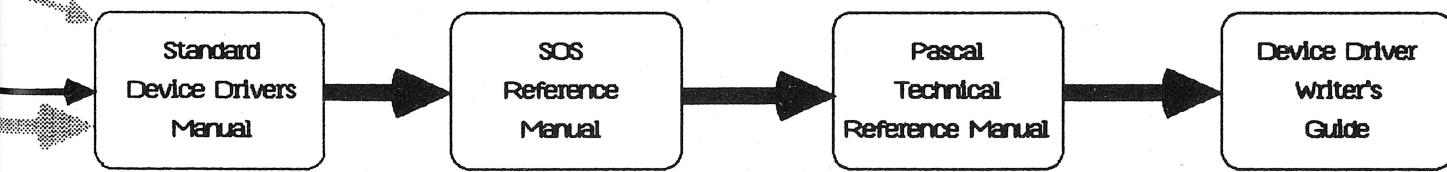
disk, the System Configuration Program. This is the program which sets up all the ///'s software for use with whatever you have plugged into it. Interestingly enough, many Apple /// users, especially the more novice folks, could live without this program, since it's really only needed when new peripherals are added to a system. Maybe it would make more sense to include the documentation on the System Configuration Program in the *Owner's Guide*, and take the *Standard Device Drivers Manual* out of the basic Apple /// package. Oh well, end of tangent.

Language Barrier

After reading the *Owner's Guide*, we should have a good understanding of how SOS looks from the user's point of view. Since we're programmers (lucky us) the next things to do is to check out some programming languages. Well, on the Apple /// we have our choice of the Terrific Trio: Pascal, BASIC, and Assembly language. (Note: Apple sells and supports a very nice COBOL, but I'm not counting it, because nobody really *writes* personal computer software in COBOL. They just download their mainframe COBOL programs.)

If you want to program in BASIC, you need Apple /// Business BASIC and its manual, surprisingly called the Business BASIC Reference Manual. This manual will explain all the features of this particular flavor of BASIC. One important item that's incompletely documented, though, is something called invokable modules. An invokable module is an Assembly language program that's used with a Business BASIC program. There is a technical note available from Apple which explains how to create and use invokable modules. To get a copy, call or write your Apple Regional Support Center (Technical Support Group, if you write). If you don't know where your Regional Support Center is, write to me and I'll send you a copy. Be warned, though: this note is intended for experienced Assembly language programmers, not beginners, so be sure you're up on your ORGs and LDAs before you go for this one.

Through the gateway of invokable modules, you can expand Business BASIC indefinitely. It's important to remem-



ber that no matter what you do in your invokable module, BASIC is still the boss, and you have to live within the constraints it creates.

If you're not a BASIC fan and prefer Pascal instead, your path through the manuals takes a different turn here. Instead of going to the BASIC system, you should go through the set of Pascal manuals. There are four Pascal manuals. The first one to read is called *Introduction, Filer, and Editor*. It presents some of the less technical points (from a programming standpoint) of the Pascal system. It talks about using two of the fundamental Pascal tools, the Filer and the Editor.

After reading the *Introduction, Filer, and Editor* manual, the next step is to peruse the rather large *Pascal Programmer's Manual*. This extremely well-written 2-volume set describes all the features of the Apple/// Pascal language. Even if you're not now a Pascal programmer, you'll find the presentation of the material extremely helpful in learning the language. If you already know Pascal, you'll be able to skim off the unique information about this particular version of Pascal. In fact, if you already know Apple II Pascal, you'll find an appendix called "Comparison to Apple II Pascal" very handy. It describes the differences (mostly upgrades) between the two versions. If you're not interested in learning BASIC or Pascal, just Assembly language, you can skip ahead to the next volume.

The third Pascal book is called *Program Preparation Tools*. It talks about some of the things you'll need to know if you intend to use the advanced features of the Pascal system, such as Assembly language modules and separately compiled units. This book describes the Assembler that comes with Pascal. If you're interested in programming in Assembly language, you should read this section, whether the ultimate result of your assembler program is an invokable module for Business BASIC, a routine to be linked to a Pascal program, or a standalone program. No matter where an Assembly language program ends up, it starts out in the Pascal system's Editor and then gets cranked through the Pascal system's Assembler.

In addition to describing the Assembler itself, the *Program Preparation Tools* manual also tells how to link your Assembly language routines to Pascal programs. When you do this, the assembler portion is declared in the Pascal program as "External". This means we've now covered two of the three uses for Assembly code: when used with BASIC programs, they're called invokable modules and their use is explained in an Apple technical note; when they're used with Pascal programs, they're called external procedures and functions, and they're described in the *Program Preparation Tools* manual. The third use for Assembly language programs, running them all alone, hasn't been covered yet, but it will be (bet you never doubted it).

The Assembler section of the *Program Preparation Tools* manual also introduces an important concept: Enhanced Indirect Addressing. This is a special addressing mode that has been implemented in the Apple///'s 6502 microprocessor that allows it to address up to 512K bytes of memory without bank switching, something that's impossible on a standard 8-bit computer. There's only a very brief discussion of Enhanced Indirect Addressing in this manual, just an introduction, really. The real in-depth stuff on this powerful feature comes in the *SOS Reference Manual*.

Program Preparation Tools also tells how to use the Pascal system's Linker and Librarian. These tools let you assemble libraries of Pascal and Assembly language routines that can be linked to your programs. In fact, the manual also contains an excellent appendix called, "A Complex Sample Program", which takes you from start to finish on a program that includes an example of just about every feature of the Program Preparation Tools: there's a main Pascal program, two kinds of library units, and Assembly language routines. Included are complete instructions on how to convert all the different pieces of source code into a final, working program.

The SOS Thickens

After the Pascal manuals, we continue our trek through the manuals with some pretty in-depth stuff. In fact, if all we wanted to know was enough to write simple Pascal and BASIC programs, we could stop here. However, we're here to find out everything we can about the Apple///, so we'll continue with the *Standard Device Drivers Manual*. The main function of this book is to provide complete information on the drivers for devices that are built into the Apple///, like the keyboard, the first disk drive, and those that plug into built-in connectors, like the RS232 port and the external floppy disk drives.

As we talked about earlier, this manual includes instructions on using the System Configuration Program, a tool which lets you create and modify SOS.DRIVER files on your boot diskettes. The rest of the manual talks about 5 device drivers: .CONSOLE, .GRAFIX, .PRINTER, .RS232, and .AUDIO. Much of the information that's presented here is very important and can't be found anywhere else. The chapter on the console driver tells you how to use control characters to do things like switch the screen between the 40 and 80 character per line modes, set the viewport, move the cursor, and lots of other functions. In addition, this chapter introduces two SOS calls known as Status and Control. These calls let you perform various kinds of magic with device drivers, such as getting rid of typeahead, changing the character set, reading the character at the cursor position, and more. For full information on the Status and Control calls to .CONSOLE, see the *Unlocking Apple///* article in the March 1983 (Volume 4, Number 2) issue of *Apple Orchard*.

The console driver is loaded with features and modes, more so than any other SOS driver, and its chapter is by far the longest in the *Standard Device Drivers Manual*. Another in-depth chapter documents the graphics driver. This driver is similar in many ways to the console driver, except that .GRAFIX only performs output, while .CONSOLE handles both keyboard input and screen output. The chapter is mainly devoted to the different graphics modes available and to the function of the various control codes that the graphics driver understands. There is also a section on Status and Control codes that affect .GRAFIX, but it's very brief; there are only 3 such calls.

The chapter on the printer driver is pretty fundamental. It tells you how to set the printer's baud rate and data format. The RS232 driver, which is sort of a printer driver expanded to receive data as well as send, is documented thoroughly. The last chapter tells you how to use the audio driver.

There are a few important pieces of information stashed away in the appendices which are easy to miss if you're not looking for them. Appendix G contains the format for some-

thing called keyboard byte B, which is the way to tell exactly which key the user has pressed; for example, it lets you distinguish between «RETURN» and «ENTER». This appendix also gives the format for a single character's bitmap, which is important if you want to build your own character set. Appendix H gives you an easy way to perform Status and Control calls in Pascal.

Well, SOS traveler, if you've made it this far, you'll be glad to know that we're in the homestretch. In fact, you might make the analogy that learning SOS is like a murder mystery. If so, then the next manual, the *SOS Reference Manual*, is the climax to the story, and the rest is all denouement. The *SOS Reference Manual* should answer just about every question you've come up with so far about SOS. It starts off by talking about how SOS works, the way it divides up tasks and so on. There's a chapter about how to use all the Apple //I's memory, and how each piece of code uses the memory it's got. Another chapter recaps and amplifies what you've learned about drivers. There's a couple of chapters on files and disk drives, also known as block devices, and how they keep track of things. The layout of directories is presented here, too, for those of you who want to go right out and patch one.

The manual continues with information about interrupts and events and how to use them. A chapter on interpreters presents everything you need to about creating your own stand-alone Assembly programs. The rest of the manual (about 150 pages) is devoted to SOS calls: what they are, what they do, how to make them, and what errors they can cause. The appendices provide a variety of information, including the format of assembly language codefiles, and the documentation for a handy program that comes (on diskette) with the *SOS Reference Manual*. This program, called ExerSOS, lets you experiment with SOS calls and device drivers from a menu-driven, immediate-response format. The diskette also contains the source code for a sample interpreter which is presented in the manual.

For most folks interested in writing just about any Apple//I program, the *SOS Reference Manual* is the end of the line. But for those who, for whatever reason, need to know more, I've got good news—two more manuals! The first is the *Pascal Technical Reference Manual*. It presents a great variety of information, including a lengthy discussion of how codefiles are created and what they look like, a description of how the p-machine works (and if you think a p-machine is a device for processing vegetables, this book will set you straight on that, too), and a chapter on how Pascal communicates with Assembly language subroutines.

A wonderful chapter called Programming Techniques talks about all sorts of goodies, including what Pascal does when you declare a data structure to be packed, how to speed up your programs, and how to take full advantage of the Apple//I's 256K bytes of memory. Also presented here are a bunch of useful macros for Assembly language programmers. The Pascal Technical Reference Manual also comes with a diskette which contains routines for making any SOS calls from Pascal without writing Assembly language code. These routines are gathered into a unit called SOSIO, which is documented in a supplement to the manual. This unit is invaluable to the Pascal programmer who wants to use the full capability of SOS calls but isn't inclined to write any Assembly language.

Driver, take me home

The final chapter in the SOS saga is presented in the *SOS Device Driver Writer's Guide*. This manual does mainly what the title implies: it gives you all the information you need to write your own device drivers that work with SOS. It talks about how SOS classifies devices and what drivers have to do, and it tells you what resources are available for drivers and how to take advantage of them. A chapter is devoted to the hardware of the Apple //I's peripheral connectors. As in other Apple //I manuals, a lot of goodies show up in the appendices. In this book, the nicest things are the complete, commented source listings for two device driver skeletons. If you're trying to figure out how to interface your Sub-Etha Superwhatsis to the Apple //I and you need to write a device driver, this manual will fill you in.

Okay, everybody stop and take a deep breath. That's it! It's interesting that not too long ago, the lack of documentation was being blamed for holding up interest in the Apple //I. Now, the //I has to be one of the most thoroughly documented computers around. When the //I came out, Apple promised that there would be no secrets; everything would be published. Now, with the release of the *SOS Reference Manual*, the *Device Driver Writer's Guide*, and the *Pascal Technical Reference Manual*, that promise has been kept.

If you're interested in learning about the Apple//I, you can use the Manual Map and Where to Get 'Em charts printed with this article. If you're having trouble finding some of the more sophisticated manuals, ask your local Apple dealer to order them for you, using the Apple part numbers given in the Where to Get 'Em chart.

Next time, we'll look at applying some of the stuff that's printed in all those manuals. Until then, happy reading, and . . . HIT THE SOS!

Where to Get 'Em

Owner's Guide—Packaged with all Apple //I systems

Business Basic Reference Manual—(2 volume set)—
Packaged with Apple Business Basic or available separately as Apple part number A3L0002

Pascal: Introduction, Filer, and Editor—Packaged with Apple //I Pascal or available separately as Apple part number A3L0004

Pascal: Programmer's Manual (2 volume set)—
Packaged with Apple //I Pascal or available separately as Apple part number A3L0003

Pascal: Program Preparation Tools—Packaged with Apple //I Pascal or available separately as Apple part number A3L0005

Standard Device Drivers Manual—Packaged with all Apple //I systems

SOS Reference Manual (2 volume set)—Available as Apple part number A3L0027

Pascal Technical Reference Manual—Available as Apple part number A3L0006

Device Driver Writer's Guide—Available as Apple part number A3L0023

WPL

The Sleeping Giant

Part 4

Many Form Letters

by Richard Loggins

If you have been following this series, you now have a series of WPL programs that will work within your AppleWriter to allow you to create and maintain an address file. Last month, we covered a WPL program that allows you to delete a file from your Address Book. The next portion of our program set (and the one that really demonstrates WPL's power) is a program to insert automatically the information contained in your address file into a letter or other document and print it. This will be accomplished by the program named WPL3, which should be placed on the same disk with your WPL1 and WPL2.

Any letter, report, document, etc., must follow a specific format if the information from one file is to be successfully inserted into the information of another file. Perhaps it's best this be discussed now.

In our address file, each record contains four fields: name, company, address, and the city. In order, these are fields 1, 2, 3, and 4. The following program (WPL3) is set up to handle more than four fields. In theory, it can handle up to 65,000; although this isn't realistic.

To place one or more of the fields into a letter, it is only necessary to enter a reference to the field where ever it is to be placed. Simply enter

{FIELD2}

and the information contained in field 2 of the address file will be substituted. However you must enter it in the format that is shown. The first character must be "{", followed by the word "FIELD" in upper case, followed by the actual number of the field, followed by another "}" symbol. There should not be any spaces contained in this statement.

WPL PROGRAM: WPL3 (Part I)

```
START NY
PND
PGO MENU
LP1 PPR
PSZ ±1
PGO LP1
PRT
TITLE PPR<Backslash>
PPR      ***** Insert Address - Print File *****
PPR
PPR
PPR
PRT
PARAMS PSR TITLE
PSZ 4
PSR LP1
PIN      Name of file to print: =$B
PCS/$A//'
PDO .D1/WPL1
PPR
PPR
PIN      Name of file to insert: =$A
PCS/$B//'
PDO .D1/WPL1
PPR
PPR
PIN      Starting record number: =$C
PPR
PPR
PIN      Ending Record number : =$D
PPR
PPR
PIN      Press "RETURN" to begin
PRT
```

The first three subroutines of this program are essentially the same as all of the previous programs. Go back and review the sections pertaining to them again if you desire.

The subroutine named PARAMS is used to establish four important items: The name of the file to print, the name of the file containing the information to insert into the letter, the beginning record number, and the ending record number. This information is placed into the four string variables; \$B, \$A, \$C, and \$D respectively.

A test is made after each file name entry to determine if only the RETURN key was pressed, with no file name entered. If this is true, the program automatically executes WPL1.

WPL PROGRAM: WPL3 (Part II)

```
MENU PSR PARAMS
PSR TITLE
```

```

PSZ 6
PSR LP1
PCS/$C//  

PGO SETLO
PCS/$C/0/  

PGO SETLO
PSX $C
PGO CKHI
SETLO PSX 1
CKHI PCS/$D//  

PGO SETHI
PSZ $D
PGO DOIT
SETHI PSZ 65000

```

When control of the program arrives at the routine named MENU, the four parameters are established by calling the subroutine PARAMS. After doing this, a series of tests are performed on \$C and \$D, which contain the beginning and ending record numbers.

The variable \$C is subjected to two different tests; one to see if the RETURN key was pressed with no entry, and one to see if the number of zero was entered. If either of these comparisons are true, the program branches to the routine named SETLO.

If SETLO is called, the variable X is set to equal one. If both of the tests performed on \$C are false, the variable X is set to equal the value contained in \$C. Regardless of the results, control of the program will pass to the routine named CKHI.

CKHI only makes one comparison on \$D, which may contain the highest record number to be used. If the RETURN key was pressed with no entry, then the routine named SETHI is called.

SETHI will set the variable Z to equal 65,000, which is just barely under the maximum limit a numeric variable can be assigned. It should be more than sufficient.

If SETHI is not called, then the variable Z is assigned the value contained in \$D. In either case, control will pass to the routine named DOIT.

WPL PROGRAM: WPL3 (Part III)

```

DOIT NY
L $B
E
D
L $A*<(X)>*<*
PGO FOUND
PGO END

```

The routine named DOIT starts the ball rolling. From here on, pay close attention to the position and direction of the cursor.

DOIT first clears the text editor memory and loads the file name contained in \$B, which is the letter. The cursor is then placed at the *end* of the file and its direction is set forward.

Next, the following command is executed:

```
L $A*<(X)>*<*
```

This command causes a portion of the file name contained in \$A to be loaded. It will load the portion of the file beginning with the current value of X, enclosed between " { " and " } ",

and all information up to and including the next " { " symbol. The result is to load the record X into the text editor memory at the end of the file.

If the record was successfully loaded, control of the program will branch to the label FOUND. If the record number did not exist in the file, an error is generated, the PGO FOUND instruction is skipped, and execution branches to the routine named END.

WPL PROGRAM: WPL3 (Part IV)

```

FOUND PSY 1
E
FNDFIELD PLS#*@(Y)@*, *N =$C
PGO NULCK
RPLC B
F/ FIELD(Y) /$C/
Y?
PGO RPLC
CONT B
PSY +1
B
F/@(Y)@/
Y?
PGO FNDFIELD
CLNUP B
F*<(X)>+<**A
PNP
PGO CKLIM
PGO END
NULCK PCS/$C//  

PGO WIPEOUT
PGO RPLC
WIPEOUT B
F*{FIELD(Y)}, **
Y?
PGO WIPEOUT
B
F*{FIELD(Y)}, **
Y?
PGO WIPEOUT
PGO RPLC

```

The routine named FOUND sets the variable Y to equal one, and places the cursor at the end of the file. This causes the cursor direction to be set backward.

Control of the program passes to the routine named FNDFIELD. The first instruction loads from memory the portion of the file between "@(Y)@" up to the first carriage return " ; " and assigns it to the variable \$C. This just so happens to be the first field of the record that has been loaded into memory.

The next instruction, PGO NULCK, is used to check and see if there is or is not an entry in this particular field. It will be discussed later.

The routine named RPLC first places the cursor at the beginning of the text file. It then looks for the word FIELD followed by the number equal to the value of Y. If found, it stops to determine if the replacement should be made.

Naturally, this will happen, and is caused by the Y on the next line. Immediately following the Y is a question mark, which terminates the find and replace function. The next instruction sends the program back to RPLC.

In this manner, the entire text file is searched for all occurrences of FIELD(Y), and replaced. If no more references are found, the command of PGO RPLC is skipped, and control passes to CONT.

CONT one again places the cursor at the beginning of the text editor. The variable Y is incremented, and a check is made to see if a field equal to Y exists. If so, back to FNDFIELD for the replacement. If not, on to CLNUP.

The routine named CLNUP removes the record that was loaded at the end of the file. The result in the text editor at this time is your document with all of the information from your insert file placed neatly into it.

The letter is printed, and control of the program is passed to the routine named CKLIM. Since all of the other routines have been explained in order, there's no reason to stop now.

Remember when NULCK was called by the FNDFIELD routine? The purpose of NULCK is to see if the field contained no entry. If the comparison is valid, control passes to WIPEOUT, otherwise back to RPLC.

WIPEOUT does just what its name says. It literally wipes out a field. It is composed of two parts. The first part searches the text for the word FIELD and the current value of Y followed by a carriage return. If this exists, it is replaced with nothing. The second part searches the text for the word FIELD and the current value of Y only, and replaces it with nothing.

The reason this routine is included is to prevent "'''{FIELD3}''" from appearing in your text if field 3 does not exist in your address file.

WPL PROGRAM: WPL3 (Part V)

CKLIM PAS (Z) (equals)\$D

```
PAS (X) =$C
PCS/$D/$C/
PGO END
PSX +1
PSR TITLE
PPR
PPR
PPR
PPR      Printing number (X) of (Z)
PGO DOIT
```

CKLIM is a routine to check the current record number to insure it is not greater than the ending record that was specified. The ending record number is contained in the variable Z. If RETURN was pressed, then Z contains 65000.

In either case, the value of Z is assigned to \$D. The current record number, contained in X is assigned to \$C. The two string variables, \$C and \$D, are compared to see if they are the same. If they are, no error is generated and control of the program is passed to the routine named END.

If the result is invalid, and error is generated, the PGO END instruction is skipped, and the value of X is incremented for the next record.

The monitor is cleared, and a message is displayed to show which record is being printed and the highest record number to be used. The program then branches back to the routine DOIT to process the next record.

WPL PROGRAM: WPL3 (Part VI)

END PSR TITLE

PPR

Apple's® new ProDOS™ is pro Thunderclock™

When Apple designed their new ProDOS operating system for the Apple II family, they included an important new function—the ability to automatically read a clock/calendar card. Nice touch.

It means that every time you create a new file or modify an existing one, the time and date are automatically recorded and stored in the CATALOG.

Now you can instantly know the exact time your files were last updated.

Apple could have chosen any clock for ProDOS to recognize, but they chose only one.

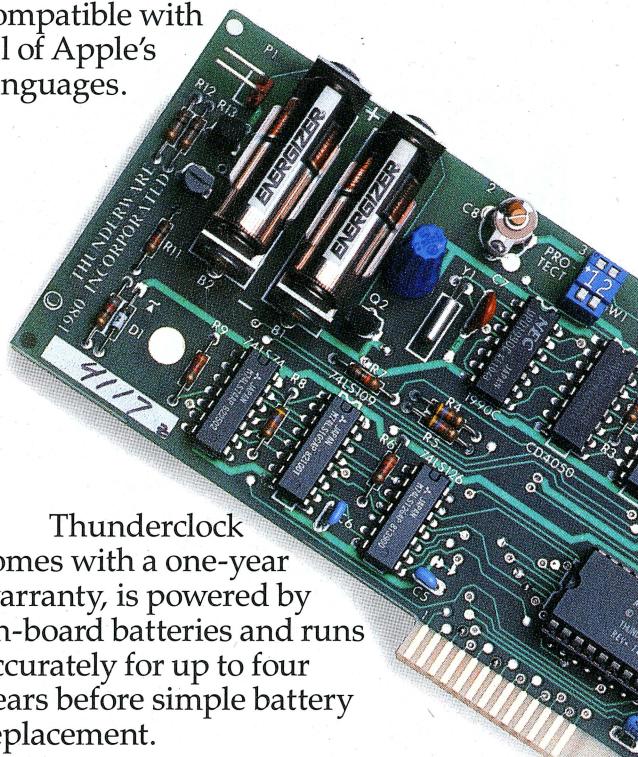
Thunderclock. It's the only clock mentioned in the ProDOS manuals.

That's a nice stroke for us, but it's even better for you.

Because, in addition to organizing your disk files, Thunderclock will add a new dimension to all the new ProDOS-based software. For instance, with business or communications

software you can access a data base or send electronic mail automatically, when the rates are lowest. Even when you're not around. And that's just a start. The better you can use your Apple, the better you can use a Thunderclock.

Thunderclock gives you access to the year, month, date, day-of-week, hour, minute and second. It lets you time intervals down to milliseconds and is compatible with all of Apple's languages.



Thunderclock comes with a one-year warranty, is powered by on-board batteries and runs accurately for up to four years before simple battery replacement.

If you want to make ProDOS really produce, take a page from the manual—get yourself a Thunderclock—the official ProDOS clock.

See your dealer or contact us.



THUNDERWARE, INC.

44 Hermosa Avenue, Oakland, CA 94618

(415) 652-1737

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Macintosh

AND THE APPLE 32-BIT FAMILY

by Morgan P. Caffrey

Macintosh, younger brother to the Lisa computer, joined the Apple line on January 24 (the same day this magazine was released), offering a faster 68000 processor with considerably less memory, and the benefit of the "Lisa Technology" for as little as \$1995.00. And on top of this, an improved "Lisa 2" will be able to run all software developed for the Macintosh.

First impression: "Mac" will not crowd you off your desk. It compacts a 9 inch black and white screen (512 by 342 bit-mapped graphics), 128K of read/write memory, a 64K ROM packed with documented user-accessible routines, four-channel sound, separate keyboard, mouse, a 400K 3.5 inch Apple disk drive, and a real-time clock with battery backup into a 20 pound portable package which can fit on about the same space as a standard sheet of paper. But throw away any toy-like images. Macintosh is here to get work done, quickly.

The basic system includes the Mac, mouse, keyboard, guided tour disk and cassette tape, a system disk, a blank disk and the power cord combined

Two generic software packages, "MacWrite" and "MacPaint", are immediately available to create documents and accompanying graphics (\$99.00). Mac also requires an Apple ImageWriter printer (\$495.00) to print the documents or graphs. No other printer is supported. The ImageWriter costs two hundred dollars less than Apple Dot Matrix Printer (DMP) and yet is faster and more full-featured. I regret that I am going to have to buy another printer because I just bought the DMP for my //e. But the results I saw with the ImageWriter are worth it.

Even adding a printer, a second disk drive and a couple of custom programs (all hopefully selling for \$99.00) the total price tag won't climb above \$4000.



The Package

Here is what you get when you open the box:

- **The system unit:** The main unit containing in a single 20-lb package the full computer, 9-inch black and white monitor with 512 by 342 graphics, two very high speed serial ports, AppleBus connector, 4-channel sound connector (1-22000 hz), built-in clock with battery backup, mouse connector and a telephone like keyboard connector.
- **A mouse:** A screen-pointer device which allows you to point to what you want to do rather than type in instructions. Personally, I never wanted to learn to use a "mouse" (sometimes referred to as "rodentary device"). I type quickly and with fair accuracy. But it only took about ten minutes to learn to use the mouse well. I tended to press and release the selection button too quickly or too slowly. Yet I can see how, in a short time, the user begins to cease thinking about using the mouse and concentrates on what to do next. Point push, point push. Easy.
- Unless, of course, you happen not to have use of your hands. There is a large population of such people in this country. When I asked how Mac might be adapted for the handicapped, Apple's "software evangelist" Mike Boich, responded that the mouse is a simple device and could easily be mimicked by voice-controlled or other technology. Apple has not made, or would not discuss, plans to service that market. Heads up developers!
- **A keyboard:** The keyboard is fine, no directional arrows (use the mouse) or ten-key pad (available if needed). No function keys (use the mouse).

- *An owner's manual.* (It was in draft form only when we visited; it's aimed at the non-computer owner.)
- *A "Guided Tour":* A package containing disk and accompanying audio cassette tape, the purpose of which is to lead the newcomer by the hand... or the mouse, so to speak.
- *A system Disk:* All you need to get started.
- *A blank Disk;* (a box of ten blank disks will supposedly cost \$49.00)

MacOptions

The Macintosh family will include the following options:

1. Imagewriter Printer - perfectly aligned with the graphics capability of the Macintosh, faster than Apple's (C. ITOH's) DMP printer. Costs \$495.00.
2. External (second) Disk Drive - \$395.00
3. Numeric keypad-\$99.00
4. Modems (300/1200 baud)
5. Macintosh Carrying Case, which holds the computer, keyboard, diskettes, cables, some papers. (Apple wanted to call it the MacPac; seems some food chain has that name reserved.)
6. A security kit (blanket?) - Includes the hardware to attach the system to a desk, chair etc, to make it theft-resistant (not theft-proof; nothing is theft-proof; ask Brink's).

See pricing summary at end of article.



Macintosh Software from Apple

Apple plans to vend only a few Macintosh software packages, so far as we could understand. The target price at press time was \$99.00 each. Apple expects that more than 100 third-party software vendors will get rich providing a host of other packages. At press time Apple had announced the debut of the following packages: (*Targeted release dates for these packages can be seen on the price summary sheet at the end of this article.*)

MacWrite, the text editor. It isn't a "full" word processor, but it's useful for 95 per cent of what people use word processors for anyway. And what it does, it does spectacularly.

MacPaint, a "freehand" sketching program with many presets for patterns, brush widths, etc.

MacTerminal (VT100, VT52, TELETYPE, 3278 emulation); the communicator with the rest of the world.

MacDraw, like LisaDraw, a more formal graphic shape construction program than MacPaint.

MacProject, like LisaProject, a program to develop PERT and critical path project schedules.

MacPascal, a Pascal with a difference: it's *interactive*, which means no watching dots and waiting apprehensively for the fatal beep.

MacAssembler/Debugger, for the machine language programmer.

MacBASIC, which is a multi-tasking BASIC; more than one thing can be going on at once.

MacLogo, which marries mouse and turtle.

Support Software

Apple seeded a hundred companies with the equivalent of Macintoshes as much as a year ago. Equivalent? Yes. Much of the software development for Macintosh was done on Lisas, with the aid of special software which creates the Macintosh environment on a Lisa. That also means that the Lisa 2 will run Macintosh software, as will be explained later.



Each company was only offered the opportunity to invest in the future of Mac by developing support software. Many felt it was worth the effort. For example, Microsoft is releasing Multiplan and a few other packages right now. During our interview sessions, Apple folks claimed that Microsoft believes that a significant portion of its 1984 income will come from Macintosh software sales. I find that surprising from a company which has done business in the CP/M environment for a number of years, but it's a good forecast for Mac.

Apple provided no information about pricing policies by Microsoft or any other companies. In fact, Apple got quite coy about naming seeded companies, choosing to tantalize rather than inform.

Knowledge-based Markets

Macintosh is intended to serve the needs of knowledge-based workers at many points in society. College students are knowledge-based and Apple is definitely aiming at the college market. Twenty colleges have already agreed to bulk purchases. They will develop internal purchase plans for their students.

Small and medium businesses which may have favorably reviewed the Lisa, but pulled back from the (then) \$10,000 price-tag, are going to find Macintosh very attractive. Apple thinks the Lisa-Macintosh combination will work especially well in businesses with from 6 to 40 employees, the backbone of American business. That market looks to Apple to be about 27,000,000 people.

Apple thinks demand will be high, and to meet it, has built "the world's most automated manufacturing plant", in Fremont, California. It can run two shifts a day, pumping out one Macintosh every 27 seconds in 9 simple steps. If demand exceeds this capacity, the plant was modularly designed and can be cloned elsewhere quickly, and at far less than the original development cost.

Lisa 2

Mac's use of Lisa Technology, combined with a more industry-standard disk drive is accompanied by a step-up in Lisa's performance as well. Lisa 2 will come with the same 3 1/2-inch Sony disk drive system so files can be shared between Lisa 2 and Macintosh. Lisa 2 also includes an internally integrated 10 megabyte hard disk which can be shared externally with Macintosh via AppleBus (see below). Apple claims the hard disk performs 10 times faster for program load and data access than Lisa's five megabyte drive does. This answers a strong industry complaint about Lisa. Apple

application programs will take advantage of the built-in routines that control pull-down menus, scrolling, screen formatting, etc.. There will be an ease of use that has not been seen before! The operating system is nearly transparent to the applications user, allowing a 'turn-it-on-and-go-to-work' approach that will overcome . . .

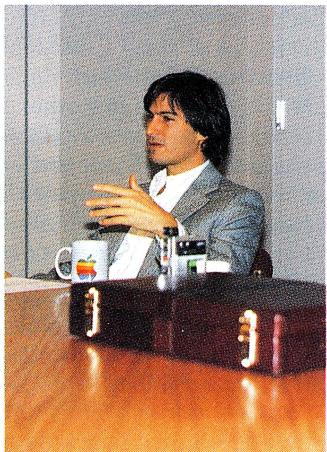
- Fear. Macintosh is a desktop 'tool'. It melts resistance by its very nature. There is no question that the user is in full control at all times. Mac quietly shows possible menu choices in dark, bold letters, and things that you can't do right now are faded out to a light background shade. Intimidated by the mouse? Ignore it, for now. Use the keyboard, and put the little rodent back into his cage until you've become familiar with the more conventional pieces.
- Size. Mac's footprint is about the size of an 8 1/2 x 11 inch sheet of paper. The keyboard is detachable, and can be placed randomly many feet away from the main unit. The nine inch (diagonal) bit mapped screen is black and white, and resolution is a dramatic 512 x 342 dots. Total weight is only twenty pounds. You want to take it home at night? No problem!
- Applications. Apple will provide an enriched environment with Lisa style, fully integrated software. (Note here that although the products will be styled after those running on Lisa, they will not be identical to Lisa products. There is simply not enough memory aboard with 128k of RAM to do all that Lisa does.) Third party support is being actively sought. Details of the sixty-four kilobytes of ROM which is the heart of Mac's operating system are fully documented. All calls to this fully documented ROM are available to third party vendors and software developers.
- Technology. Several hundred man-years of development went into development of Lisa. Another hundred man-years were spent fitting the newly found limits of technology into Macintosh. At the same time, Apple decided to go with the Apple 3 1/2 inch drive as the new standard for the Lisa family of products, as the new technology had to, at the same time, be proven and reliable. This constant effort to extend engineering 'art' is the reason that Mac's motherboard has fewer total chips than the plug-in monitor controller board on a major competitor's product. Typically, power consumption is less than a sixty watt light bulb. Speaking of 'art', take a look inside Mac's case. The Macintosh design crew's signatures are proudly displayed for all to see!

Macintosh Goals

by Gene Wilson

Macintosh is the culmination of over 400 man (person) years of technological and humanistic development. Lisa was last year's sweetheart, and it makes sense that Apple would create an entire family based upon the fruits of all that labor.

The real challenge confronting Apple management was to produce the "Lisa Technology" on such a massive scale, at such a reasonable and affordable price, that it would be made available to millions of persons; a marriage of hardware, software, proven technology, and innovation that would bring those people who'd so far ignored the "computer revolution" into the marketplace. In a nutshell, the goal was to recreate the "Apple II" story all over again.



The Mac' attack takes form on the following fronts:

- Time. The learning curve to get a new user started with a conventional microcomputer can easily range between twenty and forty hours. This is simply for competence in running canned software, and doesn't even address the process of learning languages, error codes, and operating systems. Add time for learning various configurations for different applications, and a lot of potential customers decide that doing things the old way isn't that bad after all!

Getting familiar with Macintosh takes between one and two hours. All of Apple's software, and most

Apple management is optimistic that Macintosh will be the Third industry standard. The Apple II set the first real standard, with its eight bit microprocessor, Apple DOS (Disk Operating System), and over sixteen thousand software packages. Apple concedes the second standard to IBM's PC, with its sixteen bit microprocessor (even though it only moves eight bits at a time), MS-DOS, and several thousand programs (many which are only 'clones', or revisions and/or copies from earlier Apple product releases). Macintosh's thirty-two bit, 68000 Motorola microprocessor runs at an astounding 8Mhz, can address over sixteen million bytes of memory, and has an operating system environment not seen anywhere outside the "Lisa Family".

engineers also stated that another 50% increase in disk performance is likely.

These performance improvements aren't increasing the Lisa purchase price. And, there will be a minimal-cost upgrade path (less than \$2000) for existing Lisa owners.

An Emerging Family, via AppleBus

With Macintosh, Apple is attempting nothing less than a repeat of the Apple II success story. Only this time the user's growth pattern is being anticipated. The planning is in place to let users grow to larger more full-featured Apple systems without losing the value of prior purchases.

The Macintosh and upgraded Lisa follow close on the heels of a release of the mouse, and mouse technology, for the Apple //e and Apple ///. Apple is not abandoning that line, but feels rather that because of the available software, color graphics and general utility the system will continue to be a viable product for years. Although it is not clear how it will be supported, the Apple /// is to get similar treatment for the vertical (specific to one type of business) markets.

But in any family, there must be a way to share data. The ideal situation would be for every one of Apple's computers to easily share text, graphic files, even program files with no trouble. This doesn't work out perfectly because of the different processors selected for each computer and because of the different graphic screen capacities. To me, though, it seems likely that utilities will appear that will let all Apple//e graphics be displayed on Mac and anything on Mac to work on Lisa, i.e. an upward path for graphics and a two-way path for data or text.

AppleBus

There are a couple of issues here:

1. Last year, Apple announced it was going to create "AppleNet" to serve those who needed a good local area net-

And Mac can look just like an IBM terminal when plugged into a mainframe. That item will be a godsend to students and computer facility administrators alike: the problem of all computer terminals being "reserved until next Tuesday at 3 AM" will be greatly diminished.

Frankly, we didn't hear much about the home market. Apple is too diplomatic to write it off, but it just doesn't seem to be the highest priority. More important is the business market, where Mac can be, to quote Mr. Murray, "a desktop problem-solving device."

Well, with a "footprint" less than eleven inches square, Mac isn't likely to require a separate desk or credenza; the separate keyboard, mouse, and a 10-key pad if desired, lead to flexible desk arrangements. Mr. Murray and Product Manager Barbara Koalkin claim that Mac will be the "second instrument" on the desk, right after the telephone. And with a modem, they work together. (But don't get the disks too close to the magnetic fields in the telephone.)

A number of software firms are taking the Macintosh gamble along with Apple, and Apple's position is that it doesn't want to sell that much application software. Look for a variety of products from almost 100 companies who have been working on Mac items for months. Apple will market Macified versions of Lisa software (Write, Draw, Project), BASIC, Logo, a fantastic interpreted Pascal, and a couple of other items including Mac-Paint with its electronic spray can. Data bases, spread sheets, etc. will come from elsewhere.

From the family standpoint, Lisa will also run Mac software, with the aid of what Apple II - Apple /// old-timers may call the Emulation disk, which reproduces the Mac's 64K of ROM code in a part of RAM memory. But there's more: Bob Martin of Apple says that Mac's operating system will utilize *one-half megabyte* of Lisa's RAM to provide a work place for Mac programs. Mac is enhanced when running on Lisa. (The implications of Mac having a 512K memory when 256K chips come within price range were met with knowing smiles from Steve Jobs and the other Mac folks.) That means that an office environment can be created in which not everybody needs a \$10,000 machine in order to function at the edge of technology.

For that medium-size office, Apple has been developing a devilishly clever system to hook the machines together, called AppleBus. It's not a co-axial cable network; it's a twisted-pair wire system, simple like the intercoms you hooked together as a kid. (Now if only they could multiplex onto the 115VAC line like some intercoms do...) Lisas, Macs, //es and ///s, and even some other machines, could be hooked together. Large-capacity storage and high-speed printing could be shared by many machines. At press time, the details of this system were not complete, but it's part of Apple's system concept, a concept which will help to sell both Macs and Lisas.

The Macintosh factory can turn out a machine every 27 seconds; a lot of smart money in the micro industry has been bet that Mike Murray's crew can also *sell* a Mac every 27 seconds. It's going to be fun to watch.

Marketing Mac and Relatives

by Peter C. Weiglin

Mike Murray likes cheese souffles. His tastes also run to elegant solutions to problems. As the Marketing Manager for Apple's Mac division, his line of products is elegant, and its packaging and promotion matches.

Macintosh is a computer for people who didn't care about computers; it's designed to bypass the folklore and initiation rites of the micro, just like Lisa. The "Lisa Technology" is present here, and the action is faster than what we've seen on the Lisa up to now. (Upgraded software is expected to be available for Lisa soon.)

A significant market segment is college students, and Apple has been working with a University Consortium to make Mac almost as ubiquitous as the electronic calculator. Well, why not? The machine weighs twenty pounds, and has a stylish carrying case that bids fair to become the campus status symbol of the next few years.



Inside Apple

Vol. 1, No. 4

A dot matrix printer that will improve your image.

Meet the Apple® Imagewriter, the newest dot matrix printer for your Apple Personal Computer.

And with all that it has going for it, just maybe the best dot matrix printer on the market.

Take legibility, for instance.

The Imagewriter crams 140 x 160 dots into each square inch. So you get text that's highly readable and high resolution graphics, besides.

And it is fast.

The Imagewriter cruises at an unbelievable 120 characters per second. And that's just in the text mode. It's even faster printing graphics. 180 characters per second, to be exact.

What's more, the graphics dump is up to 60% faster than other comparably priced dot matrix printers. And that makes the Imagewriter fast enough to handle the Lisa™.

Yet it's just as at home with an Apple III or Apple IIe. Thanks to Apple software experts who designed the control electronics to give the Imagewriter perfect compatibility. Not to mention some special capabilities

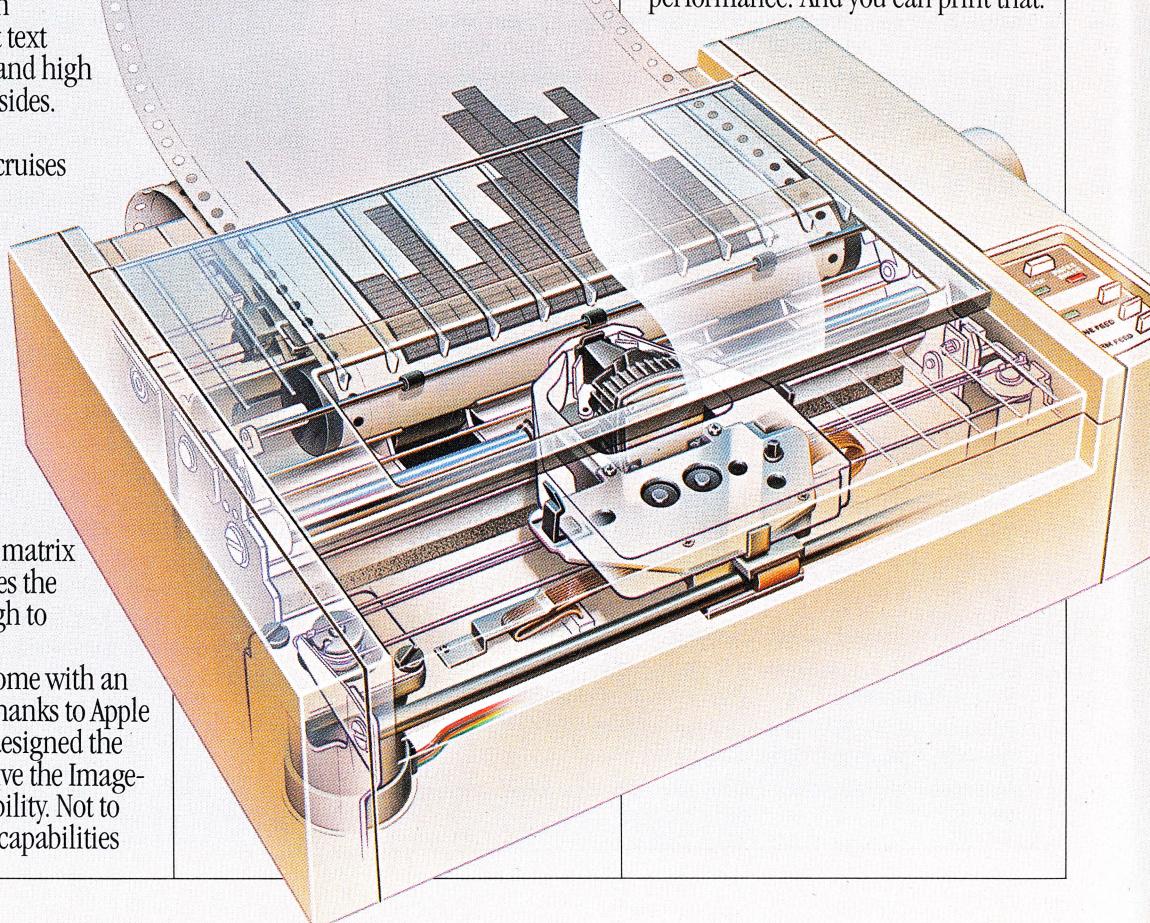
like superscript and subscript, to name just two.

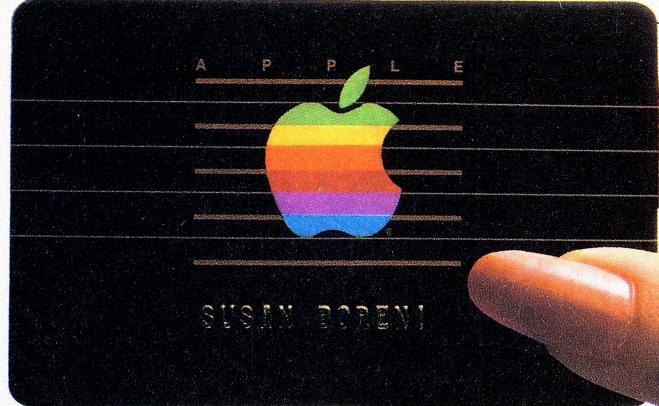
Now, with all this high-speed performance, you'd expect the Imagewriter to make the Devil's Own Noise. It doesn't. In fact, the Imagewriter is specially constructed — with overlaid seams and special sound-deadening materials — to achieve a remarkable 53 dB. How loud is a remarkable 53 dB? You'd make more noise if you read this aloud.

The Imagewriter even has quiet good looks, since we designed it to look like the rest of the Apple Family.

Yet even with all its improvements, the Imagewriter is a better deal than any other dot matrix printer with comparable performance. And you can print that.

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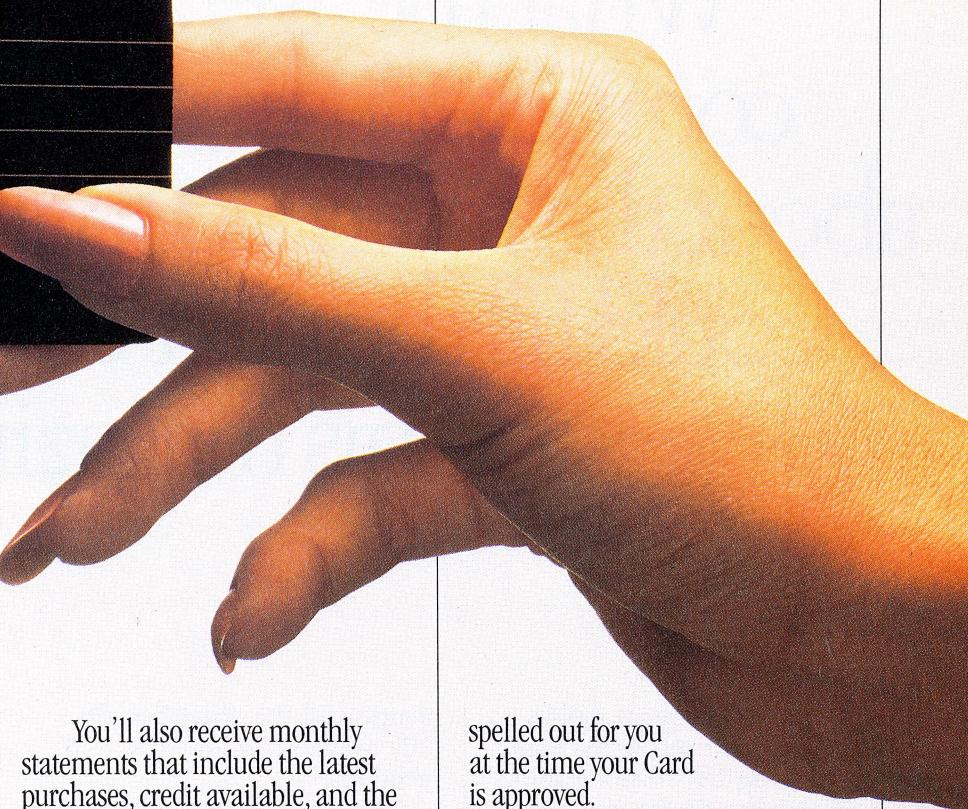
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You can then take your Apple system home. You don't even have to wait for the Card; we'll mail it out to you. And by the time you get it, you'll probably be well into doing whatever you bought your Apple system to do.

There is no annual fee for the Card, although a couple of restrictions do apply. The first purchase must include an Apple Personal Computer and you have to put 10% down. And subsequent purchases need to be at least \$100 if made with the Card. Oh, yes — you'll also have a credit limit.

When you use the Apple Card to make additional purchases, all you have to do is show the Card and sign the invoice. As long as it's within your credit limit, of course. Our dealers get a little nervous when someone signs for half their inventory. You understand.



You'll also receive monthly statements that include the latest purchases, credit available, and the minimum payment due. You'll also be happy to know Apple Card credit terms are affordable and the payments can be spread out. It's all

spelled out for you at the time your Card is approved.

So stop by a participating authorized Apple dealer and get an Apple Card. Just think of it as credit where credit is due.

Give your floppy disks the boot.

We call it the "floppy disk shuffle." It happens when you have two or more software programs on floppies and you need to work with both. What do you do? You put one disk in, boot it, do your work, take it out, put the other disk in, boot it, do your work — you get the idea.

Well, you can stop shuffling any time now.

Thanks to a unique new software program called Catalyst™ from Quark, Inc. Specially designed for your Apple III and ProFile™ hard disk.

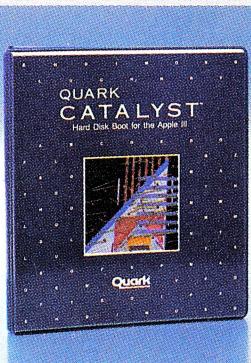
Catalyst allows you to take a wide variety of software programs and store them on your ProFile. Once they're on your ProFile, you just select the program you want from the Catalyst menu that appears on your monitor — then Catalyst does the rest. You'll never have to boot those programs again.

What kinds of programs will work with ProFile and Catalyst?

Almost anything written for the Apple III including copy-protected programs like VisiCalc®, Quick File™ and Apple Writer III. Or languages like Pascal, BASIC, or COBOL.

And once you've loaded these programs into your ProFile, the only diskette you may ever need is the Catalyst.

So if you have an Apple III and a ProFile and more floppies than you care to flip through, get yourself a Catalyst. And boot those disks for good.



What the average personal computer user doesn't know about the International Apple Core could fill the next twelve issues of this magazine.

If you're like most Apple users, you don't realize the many benefits of an IAC membership. Or what it can do for you and your computer.

So what's an IAC?

International Apple Core™ is a nonprofit organization of Apple users and user groups. We are dedicated to providing education, information and support to users of Apple and Apple-compatible products.

We aren't just a club of clubs. You as an individual can enjoy all the special benefits we have been providing user groups since 1979. You will be able to share information on new applications. Or learn the latest on products. Or keep up on Apple events. And you can receive specialized training.

If you'd like to join a local user group we can point you to one in your area. Or help you contact other Apple enthusiasts around the corner or around the world.

A membership that pays you.

As a member of IAC you practically get paid with what you will save. By joining you will save nearly \$20 on our electronic spreadsheet, IACcalc™. Not to

mention all the other benefits only available to you as a member.

By the way, we'd like to mention those benefits.

Information, please.

IAC provides you with many sources of information. Your \$30 a year membership fee brings you twelve issues of *Apple Orchard* magazine. Every page is devoted to Apple systems and compatible products. Lists of IAC user groups, sponsors, IAC notes and news, and reprints of user group articles are at your finger tips.

With your membership, you are eligible to receive our *Disk of the Month*. \$30 brings you a subscription to user contributed software. Each one presents you with themes like games, education or a potpourri.

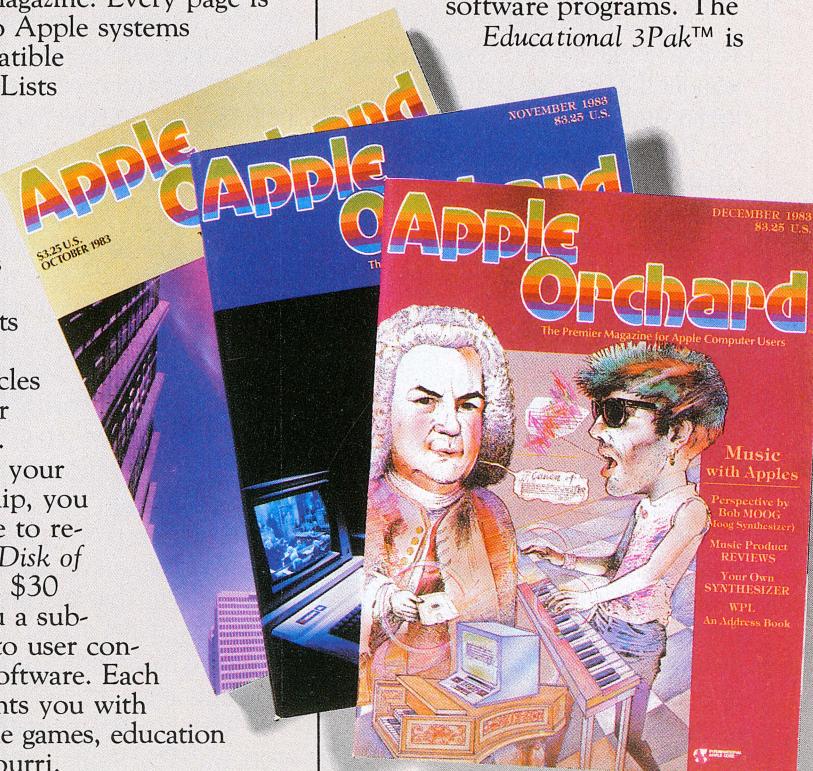
In the past, IAC has given you seminars and conferences.

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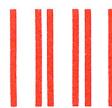
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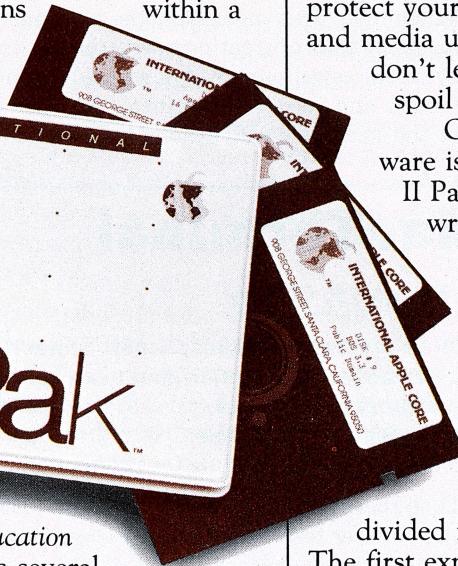
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the first in an ongoing series of theme packaged programs. It contains three disks offering programs to help you learn Applesoft and Machine language with a series of Math Tools.

If you are a beginner to Applesoft, our *Applesoft Tutorial* disk is for you. It offers you a step by step learning plan teaching the uses of syntax and its applications within a program.



Our *Education* disk presents several programs that are fun to learn with. And it's oriented to the younger set—ages 4 through 10. Children will enjoy Apple Array, Fred Fraction, Apple Barrel, Ad Drills and more. This disk contains an outstanding program for the handicapped called Voice Print. By using the cassette input at the back of your computer the child can actually generate graphic voice prints on the screen. An entertaining teaching tool, indeed. All of these programs use addition, subtraction and fractions. And the drills use full graphics. It is menu driven and easy for children to use.

Logo 3Pak™ is the second in our series of theme packaged programs. Written in the first computer language dedicated to education, it's friendly, powerful and easy to learn and use. Your children and you can perform simple projects in just the first session with Logo. This 3Pak contains the Logo Tool Kit, sample programs and documentation disks.

Support for your Apple and you.

Available to IAC members only. The first truly low cost personal computer insurance that doesn't rob you with heavy premiums or leave you with your floppies down.

For as little as \$50 annually and no deductible, you can protect your hardware, software and media up to \$15,000. So don't let uncovered loss spoil your Apple.

Our *Attach-Bios* software is intended for Apple II Pascal application writers, vendors and users. If you need to attach your own drivers or need more detailed information about the Pascal 1.1 Bios, this will help.

The program is divided into two sections. The first explains how you may use the attached utility. The second is general information about the Bios. All documentation is found on the disk.

CP/M→SOS Converter is a ready to run program for your Apple III. Now you can convert CP/M® disks to SOS® using your Apple drives. The disk contains the program's source code and character filters. And it doesn't require a softcard to run this program.

**Invite your friends
and save.
(With twelve you
get egg roll)**

IAC offers your user group a special package. For \$90 your group receives a full year membership with subscriptions to *Apple Orchard* magazine, and the Disks of the Month. Included is a listing of other IAC affiliated user groups world wide.

Individually or as a group you can't lose. So don't delay. Fill out the attached membership application on the left.

Start receiving your benefits today.

The companies we keep.

Here is a list of the corporations that support and sponsor the International Apple Core.

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Orange, CA

East Side Software Co.
New York, NY

Electronic Arts
San Mateo, CA

General Microcomputer, Inc.
Michigan City, IN

Hayes Microcomputer
Norcross, GA

Houston Instrument Division
Austin, TX

Howard D. Sams Co. Inc.
Indianapolis, IN

M&R Enterprises
Santa Clara, CA

Multi-Tech Systems, Inc.
New Brighton, MN

Nestar Systems, Inc.
Palo Alto, CA

Nibble-Micro-Sparc, Inc.
Lincoln, MA

Omega Microwave
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Source Telecomputing
McLean, VA

Sundex Software Corporation
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work. Looking around this year, Apple guesses IBM has a better lock on that market in terms of sheer numbers (regardless of relative system quality) and Apple will simply support any published protocol IBM creates.

2. Apple will release and support a shared hardware "bus" (similar in concept to the shared data bus within most computers), a minimal network, called AppleBus. At last report, Applebus will transmit information along a shared wire-pair at 230000 bits per second. Any device attached to the bus simply (it isn't really simple but . . .) has to figuratively "raise its hand" to get access to the bus, send an information packet to the desired device (printer, plotter, disk, etc.) and release the bus. In this manner, sixteen devices may use the AppleBus, apparently simultaneously, by sharing split-seconds of access-time. At 230K-bits the information packets can be fairly large and not take up much transmission time. Distance between devices can be up to 1000 ft.

Cost to install an AppleBus in the Macintosh is not settled, it could be from \$15-25. In the Apple //e and Apple ///, the cost will probably be higher since a slot will be used and other circuitry will be required. But the expense to add capacity to an existing hardware configuration, beginning with the Apple //e and moving right on up to the Lisa (and beyond?) will not be a mysterious, expensive job.

This way, Apple users will be able to share more expensive devices (such as the Apple Laser Printer (June 84?) or the Apple 74 Megabyte Hard disk (June 84?) with 20 megabyte cartridge backup).

Programming Tools

For those of you who get the programmer's gleam in the eye, (or want to see what programming is all about) the programming languages (Assembler, Pascal, BASIC) will become available during 1984.

I looked at (but didn't have time to work with) examples of Pascal and BASIC. There was no documentation available at the time. Here is some of what I saw.

64K ROM

The heart of Macintosh is the 64K ROM. Apple spoke glowingly of the "hand-crafted" nature of the code, fully documented in three binders, intended for direct use by programmers in BASIC, Pascal, Assembler or whatever comes later.

By making simple "calls" to the ROM routines, the user has the ability to create his/her own pull-down menus, and use the mouse to make selections. All of the routines are intended for use. Creating applications is intended to be a matter of knowing the subject material and creating an interface consistent with Lisa Technology methods. It feels a little bit like sitting down to play poker with the house providing more than half your betting stake. It gives you a lot of room to move.

MacBASIC

To put the last first, the MacBASIC includes a task-scheduler which allows you to run as many programs simultaneously as you have memory to run. This is fun. I watched two separate graphics-generating programs active at the same time in separate windows.

More importantly, this means that you can continue to program while you are busy running your sort or other process-

ing program which would normally have you waiting around. It could be a very real time saver. I don't know if it would allow background use of the printer. If so, this is a substantial utility.

MacBASIC allows but does not require line numbers. This means you can use line-numbers only where you want to GOTO or GOSUB and should make the listings easier to read and the programs easier to maintain.

As indicated above, MacBASIC has the ability to make function calls which use all of the ROM utilities which come with Macintosh. This means that the previously frustrating programming task of creating useful menus, error-checking the key-stroke selections etc. is downloaded (uploaded) to the ROM menu and selection routines. The user interface can appear the same as for all system utilities and programs.

MacTerminal

by Morgan P. Caffrey

The process of making a smart computer act like a dumb terminal is analogous to a lobotomy. The terminal program just collects characters from the keyboard, doesn't store them, but just forwards them through the modem to a distant computer.

Then there are smart terminals. These allow the distant computer to economize on characters transmitted, sending a single character to clear the screen, a set of characters to position the cursor, etc.

Emulating a smart terminal is just a little harder than emulating a dumb terminal. The smart terminal emulator translates certain characters, filters out certain others, and performs video screen clearing and cursor positioning based on agreed-upon command sequences. Macintosh can emulate a number of smart terminals.

IBM has for years had a special terminal family, the 327X, which is designed especially to communicate with IBM computers. The terminals aren't cheap and there has been a brisk business in past years by companies creating software emulators of the 327X series. Macintosh has a very good 3278 emulator. It will be released sometime before March. It makes the Mac much more attractive to businesses which are already purchasing computer services from, or own, IBM machines.

Christiansen Protocol

A gentleman named Ward Christiansen described and implemented a very useful terminal protocol for computers pretending to be terminals. It allows files to be transferred directly from the disk storage of the sending device to the disk storage of the receiving device. It takes the time to verify that each 128 character sector has been correctly transmitted.

Many of you may already be using this protocol with the public domain program "MODEM7". Commercial communications software packages like *ASCII Express* and *Z-Term Pro* use Mr. Christianson's protocol, which is also widely used throughout the Bulletin Board Systems (BBS), hundreds of which have sprung up around the country. Macintosh honors the Christiansen Protocol.

MacPASCAL

I am not fond of Pascal. MacPascal looks good. The demonstrator and I agreed that the Pascal environment has been one for experts. You couldn't make much progress without understanding the Filer, Editor, Compiler, Linker, etc. It takes time to get executable code and even more time to get feedback on individual problems and each problem fixed requires another compilation. (A lot of Pascal fans are going to disagree with this, but I'm wearing my critic hat here, not just reporter).

MacPascal is executed interpretively. That is, write a small snippet of code and test it. Edit code as though using MacWrite. All cut and paste features are available.

MacPascal comes with a debugger which includes a single-stepper. The single-stepper provides a little pointing hand indicating which source code line is being executed. Since you have multiple windows to work with you can look at code output and source code simultaneously. Discover a bug, fix it, keep right on going.

Pascal does not share the MacBASIC quality of allowing multiple programs to run simultaneously. Since both MacPascal and MacBASIC are expected to make major use of system calls to the system ROM, it is unlikely that there will be very great compatibility with other Pascal systems.

Mac-inations

by Scott Knaster

What is a Macintosh?

A Macintosh is a new computer from Apple that is more than it seems. A listing of the Macintosh's features will not describe it, even if you talk about goodies like icons and mice and windows. The only way to really know what all the fuss is about is to try one on for size, in other words, to see and use one for a while. But what makes Macintosh so special? Revolutionary features, low price, high power, nice carrying case? Let's take a look.

First, we'll see about those revolutionary features. Bit mapped graphics, mouse, pull-down menus, windows, icons, and all the other trappings of the Macintosh user interface are a big part of the Mac's attraction. But wait a minute — haven't we heard all this before? Yes, we have, because (of course) Macintosh borrows these things from another recent Apple product, the remarkable Lisa, which was announced just about a year ago. Of course, the Lisa can do lots of things that Mac can't, such as running more than one application at the same time, or supporting a megabyte of memory. These additional features account for the difference in price.

So what does Macintosh present that is really new? Two things, mainly: First, it gives users the Lisa-style user interface with many of the same capabilities at a lower price; and second, it will, when released, allow an experienced Pascal or 68000 Assembly language programmer to write software that uses the Macintosh user interface without having to learn a new object-oriented system such as Lisa uses. Those who have seen the Lisa's

object-oriented development system (LisaPort) will argue that it is more powerful than Mac's way of doing things. While that's true, it's also true that there are more programmers who will figure out Mac's tools right away than those who will be immediately comfortable with Lisa's.

There's one more very nice compliment we can pay to Macintosh: it's not an IBM-PC clone. Not that we (necessarily) have anything against the MS-DOS standard, but why does the world need a hundred different computers that feature it as their one and only way of doing things? Apple is one of the few big companies left in this industry that appears to be capable of doing something exciting, as it has done with Lisa and Macintosh. Macintosh will open up personal computing to lots of people who never touched a computer before. What will this column be doing? We'll be looking at things from several different angles. We'll talk about new products you can use with your Macintosh as they're announced by Apple and other companies. We'll also talk about writing your own Macintosh programs and how to use the Mac's user interface tools. It should be a lot of fun.

Until next time, go out and get a look at a Macintosh. Even though the year 1984 is really here, computers have gotten more personal than ever, which means that the dread associated with the year is largely unjustified.

(Mr Knaster, who steadfastly resisted being called "Scotty" in honor of the new machine, will be with us each month with the latest on this new computer. Beam us up, Scott.—PCW.)

Mac's Organizer

by Gene Wilson

At the 'heart' of Macintosh is the "Organizer", the grandchild of earlier control programs such as the UCSD P-/System's Filer, and the child of the Apple // 's System Utilities. All actions you take are controlled here.

The Organizer controls all disk and peripheral access, formatting and initializing of diskettes, location, type, and size of documents, etc. This control program also says when a diskette can be removed from its drive. It is not possible to pull a diskette out of the Apple 3 1/2 inch drive by hand.

Programs, applications, and documents (data) are arranged in a number of ways, all which can be set by user commands. Sorting of files can be alphabetical, chronological, or by picture (screen icons). Following the pathname concept from the Apple //, it is also possible to have a picture (or icon) that is simply a header for a long list of files grouped within a subdirectory.

The Organizer is responsible for keeping track of the windows which can be 'piled' one on top of another (if you like a messy desk, you can have a cluttered screen as well!). Only the top window is active, but the others can be manipulated so that any of them could end up on top.

You don't have to worry about where everything is; simply look at the screen then decide if that's what you want to take care of next. Window sizes can be changed at will. Accessories can also be put onto the screen display. They include a Calculator, Puzzle, and an Alarm Clock. Accessories and windows can be opened/manipulated from application programs.

Pull-down menus are also under the Organizer's control. They include the File, Edit, and Arrange Menus. Actions that can be taken by the user are shown in bold letters, and all unopened or unavailable activities are shown by a much lighter grey scale. The menus operate identically in all of Apples' software packages.

that won't be readily duplicated elsewhere.

An important note here is that Macintosh-created programs will run on Lisa computers as well; not as Lisa programs, but in an "enhanced" Macintosh environment. This environment, created within Lisa's Megabyte of "core," boosts Mac's main memory to its one-half megabyte design limit. Large applications, four times the size of Macintosh's initial 128K of main memory, can be accommodated. (Don't let anyone at Apple Computer hear you refer to them as "Big Mac'lications"!)

Pascal has never looked better. Nor has it ever been easier to use! MacPascal features will include:

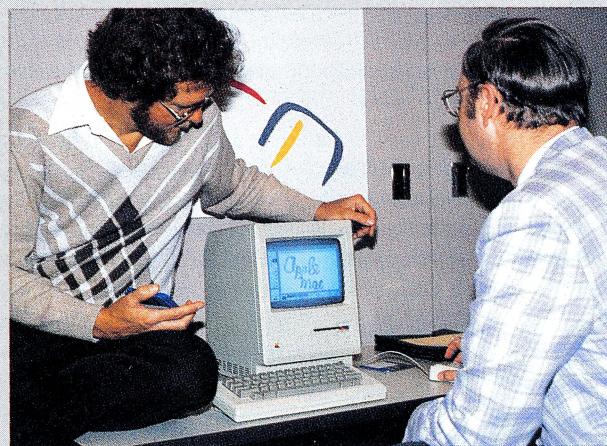
- An interpreter. No more calling on the Compiler only to find (usually after several minutes of disk operation and swapping) that there is a small problem three hundred lines into the program). The benefits outweigh the objections that are normally associated with interpreters. Compiled programs run faster than ones which must be assembled one line at a time, each time they are run. The combination of Mac's processor running at 8MHz, with screen, I/O, operating system and mouse running in response to direct calls to the "Toolkit", make for fast program execution.
- Text formatting/editing. MacPascal supports same style editing of program text as MacWrite. A very strong effort has been made by Apple Computer to make sure that ALL Apple modules do the same things in the same way. Working window size can be altered by user to allow concurrent use of multiple screens to display a running program simultaneously with the program listing.
- Cut/paste ability will reduce the need for standing libraries (which aren't supported in this version) as portions of other Pascal programs can be 'clipped' and inserted into the current work. Works just like MacWrite.
- Syntax checking on entry. It is not necessary to run the program to find errors. Simply type in a line and press the 'return' key. Any problems with syntax, undefined variables, undimensioned arrays, etc., will be brought to your attention. A message will tell what the error is and where it occurred. (No more error message tables to look up!)
- Prettyprinter feature indents text automatically. Reserved Pascal words are displayed on the screen in bold letters. More nice features!
- Debugger. Capability exists to set screen windows (you get to set the sizes of each) for both output and display of the lines being executed. Note that both are up on the screen running simultaneously! Breakpoints, tables of variables (with their current values), and single-stepping (executing the program a single line at a time), are all supported. A small hand points to the line being executed. Nice touch.
- Completed programs can be "moved" to the Lisa's Pascal environment. Lisa's Pascal compiler will then generate 68000 assembly code. That's right! The compiled program can then be run by all members of the Lisa Technology family; not as a MacPascal program, but as a stand alone program that will run ten to fifteen times (or more) faster than its interpreted version.

Program Development

by Gene Wilson

Several programming languages are being prepared for release on the Macintosh. Common to both MacPascal and MacBASIC will be the ability for programmers to directly access the Macintosh "Toolkit."

Use of the Toolkit's calls allows common features to be seen in all programs. Disk Access, Input/Output, the mouse, pull-down menus, and windowing are all controlled by these calls to a single 64K of ROM memory. All of Apple's program modules will operate identically (for the most part), and third party software developers (and you) can save time and money (and increase speed of program execution) by use of the Toolkit's features! Over five hundred system calls are well documented. It is not certain exactly how detailed the release of information will be at first, as there are plans in the works for an assembler/debugger package as well!



This strong support for a specific implementation will not create programs which can be transported easily to environments outside of the Lisa Technology Family. However, it is possible that the programs running at 8MHz, with screen windowing and I/O mostly controlled by 'assembly level' routines will be in an environment

Basic has not previously been so highly structured in an Apple environment. MacBASIC's more notable features will include:

- Another interpreted language, it has the same text formatting/editing, and syntax checking in the same style as other Apple Macintosh application packages. Like MacPascal, it also runs at 8Mhz.
- Cut/Paste features of other Apple created application programs will be fully supported in MacBASIC, too. (An interesting side point is that logos, pictures, whole screen displays, etc., can be 'clipped' as bit-mapped images and stored to be called later by a basic program).
- The last one hundred lines of an executing program are stored for viewing. On any unplanned crash of program, these lines will give a critique of events that preceded (and created) the failure.
- Multiple programs can run simultaneously, up to the limits of available memory. With three levels of interrupts implemented, it should be no problem to assign priorities to your programs. With the built-in clock being polled, it will be possible to do many things in real-time.
- Line numbers are required only on those lines referenced elsewhere in the program. This will allow a much cleaner program, with fewer line numbers, and greater clarity of thought. (It can also allow the sloppy programmer to dig a hole so deep that he/she can't get out). And if...
- You don't like line numbers? Name each of your subroutines. That's right. It's possible to write very clear code with meaningful 'nametags' that describe the routines being used.

Apple computer has other products on the drawing boards. They include MacAssembler/Debugger, MacWrite, MacPaint, MacTerminal, MacProject, MacDraw, and MacLogo. Further, Apple Computer has seeded over one hundred companies with Macintosh environments in which to create end-user programs/products. There will be modified versions of Lisa software running on Macintosh as well.

surprised to see 10 megabyte ProFile-type hard disks available for other Apples as well.)

- A built-in 3 1/2 inch Apple drive will offer 400K of removable storage. This disk drive is quickly becoming an industry standard, and is less complex than the "Twiggy" drives that were installed on the Lisa 1. Frankly, Apple would sooner forget those drives, and probably hopes that everybody else will forget 'em too.
- There is full integration between Apple's software modules. It is now possible to move portions of one module into another, i.e., a portion of a LisaProject model can now be placed within a letter being prepared in LisaWrite, and a logo prepared with LisaDraw could be made part of the same letter.
- MAC'ulation Mode? The Apple disk drive unit and compatible operating environments allow Macintosh applications to run on Lisa in an "enhanced" mode, with one-half megabyte of memory available for program use.



Apple has decided to sell the Lisa 2 at no increase in price from the Lisa 1. It will also be possible to buy a Lisa 2 with only 1/2 megabyte of RAM on-board, which will offer a substantial savings on initial purchase. This will allow more people to step up to Lisa.

Lisa 2 will be of particular interest to the business community; especially to the medium-size business that employs between six and forty workers. This relatively untapped marketplace is a primary target for Apple Marketing. To make the package unresistable, the following enhancements are planned for future release:

Lisa Update

by Gene Wilson

Meet Lisa 2, the new top entry in Apple's 68000 microprocessor, 32-bit family of computer products. Standard features include:

- A high speed, 32-bit operating system, running at 8MHz. So much for complaints about relatively "slow" window openings.
- On-board memory is a full megabyte of RAM. (Be aware that the 68000 microprocessor can read over 16 million bytes of main board memory, so it's a technical possibility that there could be larger configurations for applications that are memory intensive.)
- A Ten Megabyte, reliable Winchester technology, Hard Disk, built-in to the computer. (And don't be

- AppleBus; an interconnect for information transfer and shared services. Typical installation could have Lisa sharing files and program storage, transferring text, etc., for as many as sixteen devices. Devices could be a mix of Macintoshes, Apple//s, Apple//e's, but the use of 6502 devices (Apple II and //) could have some software limitations. Use of a "twisted wire pair" and control software could make for an very inexpensive 'local network'.



What About Lisa 1??

The release of Lisa 2 raises questions about upgrading of Lisa 1. Current owners will be relieved to know that they haven't been forgotten. Apple will offer a retrofit through its dealer network *without charge*.

The 'Spring Cleanup' will include:

- Hardware speedup of the 68000 microprocessor increased from 5MHz to an astounding 8MHz.
- Operating system software has been improved. Some operations will be as much as ten times faster. Disk access will be about twice as fast.
- Software provided by Apple has been upgraded to have full integration between modules. LisaProject, for example, will be expanded to include manhours, cost accounting, etc. for project nodes.

Apple spokesmen could not say how the conversion from "Twiggy" drives to the new Apple 3½ inch drive would be accomplished. No firm answer was available at press time. Apple assured us that the upgrade would bring the Lisa 1 into full compatibility with other products of the LISA Technology family.

Apple will also offer a ten megabyte hard disk installation into Lisa 1. Although this upgrade will not be free, Apple claims that its pricing strategy will be "aggressive." The unit will cost about two thousand dollars. Lisa 1 owners with ProFile hard disks can still use these units for additional storage.

- Apple's first Communications Server, which will be a Lisa 2 controlled, high capacity, hard disk. With 74 Mb (million bytes) of on-line (readily available to a running program) storage, and a 20 Mb removable cartridge, this unit will allow small businesses to keep their records on computer, and in-house. Price for this high capacity disk will be about seven thousand dollars.
- Apple's second Communications Server, which will be controlled by a second Lisa 2 in the same office environment, will be an "insanely inexpensive" Laser Printer.

Apple's goal during over 400 man (person) years of development, was to build the best personal computer in the world. Many people will come away from demonstrations of the Lisa 2 with the belief that the goal has been achieved!

The Macintosh story has only begun to unfold. Be sure you don't miss any of the exciting tales yet to be told.

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Macintosh Pricing Summary

Product	Price	Available
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Carrying Case	\$99.00	Now
Security Kit	\$49.00	Now
ImageWriter Printer	\$495.00	Now
Modem 300	\$225.00	Now
Modem 1200	\$495.00	Now
AppleLine	(under)	\$1300.00 First Quarter
3 1/2 inch box (10 disks)	\$49.00	Now
MacWrite/MacPaint	\$99.00	Now
MacTerminal	\$99.00	First Quarter
MacDraw	\$125.00	Summer
MacProject	\$125.00	Summer
Macintosh Pascal	\$99.00	Spring
Macintosh BASIC	\$99.00	Summer
Macintosh Logo	\$99.00	Summer
Macintosh Assembler/Debugger	\$99.00	Spring

The Prime Plotter

Review by Woody Liswood

THE PRIME PLOTTER is one of the most useful programs I have yet to come across in the Apple DOS environment. It adds significant capabilities and features not found together in any other program I know about.

On the other hand, the Prime Plotter has, in my opinion, the poorest user interface I have yet to find. The Prime Plotter goes from menu to menu to menu and back and forth between menus, and it has a variety of options and decisions. Each decision chains to another menu or submenu and the menus are horizontal or vertical and they may be coded or not and if you do not use the program daily you need to relearn it each time and the documentation makes no sense sometimes and lots of sense at other times and well, I get very frustrated and that is how I feel— «RESET» (*Author*).

It does regression analysis as well as plotting and general graphics. It does pie charts, bar charts, stacked bars, three dimensional bars, floating 3D bars, pies, 3D pies, text, special character sets, high - low charts, and almost anything else you might think you need for a graphics and plotting program. You can do this and choose your colors for every individual element in your chart. If you have the desire, you can even draw free hand on your screen.

A valuable feature for business use is called a REPLAY file. The Prime Plotter can store the results of your work in a variety of ways, one of which is to record the keystrokes you used to create your graphics. Additionally you can save your picture screen in a compressed mode as well as a standard file. That means you can have many more pictures stored on your disk than normal. You can use the replay function to recall a series of pictures from your disk and use your computer screen to have your own special slide show, or you can use replay to recall a series of compressed pictures which you have saved and show those pictures as part of a automated slide show. In fact, the Prime Plotter is so sophisticated that you can even add delays into your slide presentation so that you can have some slides on the screen for a few seconds and other slides may stay for as long as you wish. At least according to the documentation. I did not try to figure out how to do all of that and although the capability is supposed to exist, I did not recall reading about how to do it in the documentation. When I need it, I will do a paragraph by paragraph search and see if I can find it.

The program is modularized so that you can add additional statistical and plotting modes in the future. I have talked with the author, Eli Argon, and there are plans to develop The Prime Plotter as a complete business plotting and graphics system. Eli will even design and add specialized statistical modules for you for a small fee.

I have used and reviewed most of the statistics and plotting programs available for Apple DOS. I can say, without reservation, that The Prime Plotter has more plotting capability than any other program I used so far. It also has a reasonable statistics package so that you can do a varied set of curve analyses and plot the data with a minimum of effort.

Criticisms

First things first. I have no criticisms of the program as it runs. I have lots of criticism of how you get to the various features and how you go about creating the graphics. I could get it to bomb on occasion.

The Prime Plotter is rather well protected and sometimes refuses to boot. I hesitate to recommend that any business purchase a program which is not copyable. This program is so technical and business oriented that I feel there should be no protection scheme. I doubt that the business purchaser will share this software with other folks.

The other criticism is technical (or perhaps personal). I do not like the data entry system. The Prime Plotter requires that you enter your data in sets of variables rather than in sets of related cases. That, to me, can cause major problems in editing and correcting the data. When I mentioned this to Mr. Argon, he said that many of the users of the Prime Plotter had requested this type of scheme. So, perhaps I am wrong. You should make up your own mind.

Here is what I mean. When I am doing a curve fit, or a set of curve fits, I have an X variable which is related to a specific Y variable which also might be related to a specific Z variable. For example, as a personnel consultant, I might have a salary grade "3" with an average market salary of \$1,200 and an average current salary of \$1,300. I would prefer to enter that data as a single case with three variables. The Prime Plotter, however, has you enter the data in as a series of X variables, then a series of Y variables, then a series of Z variables. That, for me, is a royal pain because there is no way for you to determine that you have made a mistake until after you have completed all of the data entry. In fact, if you made a subtle mistake which might be recognizable by glancing at the screen . . . like having the value which be related to the 10th Y value in the 9th position, you may never discover your mistake. You might then act on the results as if you were doing what was appropriate.

Your only choice is to check very, very carefully after you have done the data entry. You should immediately display the data on the screen so that you can insure that all of the cases line up correctly. The edit function works rather well, so that if you discover an error you can correct it without too much trouble. In fact, the program actually displays each set of cases in lines of alternating inverse so that you can read across the screen horizontally to help you track down those errors. Then, if you discover a problem you can correct just that one entry or you can re-enter the entire set.

Printing the Graphics

The Prime Plotter will generate immediate graphics on your Epson printer or it will store the screen image as a standard DOS binary picture file.

If you own a digital plotter, you have the option to print your file directly on your plotter rather than to the screen. That means you can have, in effect, a screen dump on your digital plotter in the digital plotting mode rather than in a dot-by-dot mode as done by a dot matrix printer. You don't actually get all of the special character sets that might be shown on your screen. You do, however, get a reasonable translation. Figure 1 shows what one screen looks like when

printed as a normal screen dump. Figure 2 includes that same file plotted on my Strobe 100 digital plotter. In my opinion, there is a significant difference. I have shown both of these types of graphics to clients in my consulting practice and they have all said they would rather I produce the graphics using the digital plotter rather than the dot matrix screen dumps. That's enough for me.

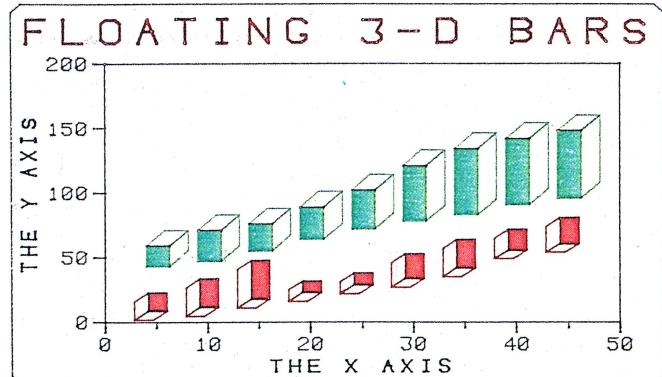


Figure 2

I tested both a Strobe 100 interface and a HP 7470A interface. The Strobe worked, the HP did not. Mr. Argon said the problem was my plotter. Hogwash; it works with other programs. The Prime Plotter folks on two different occasions said they would send me a new HP disk. It has never arrived. I really hate it when a software publisher wants to argue with me about a problem rather than try to help me solve the problem. It's like the original problems with DB Master. They always say it is the disk drive, while off the record saying that the problems are with the copy protection scheme.

Let me also relate another experience I had with these folks. When I first received my review copy, it came with only one disk. There was a note that you could purchase additional replay disks, but that you were allowed only one master disk. If that bombed, you had to return it with bucks to the Prime Plotter folks and they would send you a new one. That is the greatest paranoia that I have ever experienced about somebody maybe having too much program. I really did not believe it so I called them and asked if that were really true. Yes, I was told, that was the case, but that they would get the disk back to me within a couple of days if there was a problem. I asked them if they seriously expected a business person to shut down his business for a few weeks (the mail being what it is) to get a duplicate copy of a program which is being used. Yes, I was informed that was the way it was. About three days later I received a letter saying that they had changed their policy and that now you could get a backup disk immediately.

So why mention this? I think that the market for business related programs is getting rather asinine. With no copy protection for CP/M based programs and very little protection in the IBM market (most of those programs are rather easily copied for backup), why should the producers for the Apple treat a business purchaser as if he/she were a thief. I would like to see a lawsuit against a provider of a copy protected program when that disk failed because of the copy protection and there were problems with the backup or with the unusual

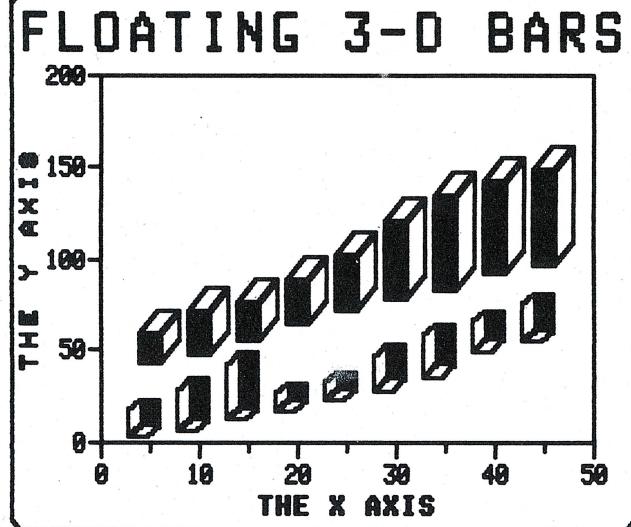


Figure 1

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System requirements: Wildcard: Apple II + w/64K, Apple IIe, Wildcard 2: Apple II, II+, IIe, Wildcard Plus: Apple, II, II+, IIe. All cards work with Franklin computers. An \$8.00 mod kit is required for Franklin 1000, 1200 (for use with Wildcard only).

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DOS that was being used and a client was lost and the dollar loss was identifiable and then lets see if the purchasers of programs have rights also. (*End of Editorial*).

Documentation

The Prime Plotter comes packaged attractively in a well designed three ring binder. The documentation is complete. I, however, had another interesting relationship with the documentation. The program does so much, and has so much flexibility, that it is impossible to show and discuss every permutation and possibility. At least that is what the documentation says and I agree. So, you are instructed to play with the program, go through some of the examples and get to learn the capabilities in that manner.

I, personally, find that type of instruction useless. There is a set of tutorials in the rear of the manual but they only instruct you to press a "1" then a "3", etc... without explaining what you are doing and why. You are instructed to watch the screen and see what is going on so that you can understand what you were doing. Bunk! I tried on four different occasions to try to get the program to run and had very little luck. I probably put in about 6 hours before I began to think like the programmer and understand what he was trying to tell me to do.

After I discovered the logic behind the menus, the program became relatively easy to use and probably one of the most valuable additions to my business library. My advice to you, if you purchase the program, is to not just sit down to try to use it as an idle curiosity project, but to have a problem to solve so that you will be forced to get a result. I will give you an example of how to use the program, with explanations, as part of this review so that perhaps you not have to endure the same frustration which I did. Also, I did call the Prime Plotter folks a few times during my learning to use the program. They always responded. Many times they pointed out that "paragraph 3 sentence 5 on page xx had the two words that would have helped solve my problem." That really bugged me. Where was a good index? Why do I have to search, paragraph by paragraph, line by line to find something when I need it?

MENUS

The Prime Plotter works by using menus. *Lots* of menus. I have counted 26 so far and have not yet found a use for all of them. And, to make matters even more interesting, many of the menus have sub menus to add to the confusion. The main choice menus are shown in a vertical format. The sub menus are shown in a horizontal format. The menus also use abbreviations which are supposed to be indicative of the choice. To top it off, in some of the items, you make a choice, you are asked if that is really your choice, then you are again asked to confirm your choice, then you get to make the choice for real. WHEW.... I wonder what type of person those prompts were designed for since I feel that if you are asked, once, to confirm a choice, that should be enough.

Statistics

There are lots of statistics for your pleasure. You can do Linear, Exponential, Logarithmic, Geometric (power), Inverse, Inverse Log, Spillman, and up to a 6th degree polynomial regression. You can also average and smooth those data sets, convert a set to percentages, and have basic descriptive statistics calculated. The basic description stats are

the same, minimum, maximum, mean and standard deviation that most statistical programs produce for you. Once you have done your calculations, you can use the results of the calculations in almost any imaginable graph, chart, or report.

X Y PLOTTING

The X Y plot is probably the most used graphic. You can display data, mathematical functions and statistical results. And, if you are into it, you can overlay one chart or line with another to see comparisons of data sets. And, you can do it in full color.

The X Y graphic module allows regular, Hi-Lo, error bars, and horizontal or vertical orientation. You can also have a scatter gram with a variety of special symbols to show your data. You can then use dashed lines, regular lines, area fill, bars, unique figures, multiple bars, 3-d fill, and 3-d bars.

Then, you can define your axis to any width you want, plot tick marks as needed, label your graphics using a built in function, or create a label using The Prime Plotters built in special characters.

Pie Plots

The pie plotting module is just as complicated. Let me quote a paragraph from the documentation: "You can define the pie location, shape (whether circle or an ellipse), size, add 3-d perspective, select filling method for each piece, and emphasize any piece by pushing it out of the pie center and/or enlarging/reducing its size. You can also select the filling methods and colors for each individual piece. Up to 15 pieces can be defined within a pie. However, you will discover that this limit can be easily bypassed by combining several data sets within a pie chart, thus achieving, if desired, even thirty division within one pie." My only comment is "How?"

Labels

There are two ways to generate labels. You can create standard text just like you see on your screen, or you can access a shape table and use any of a number of special character fonts which come with the program. When you want to position those letters on the screen, you can identify pixel coordinates, point with a joystick, or use the keys to direct the cursor.

Or, you can free draw the same way and make your own graphics.

Replay

While all this activity is going on, the Prime Plotter is storing the results of your instructions in a "replay" file. Then, at any time, you can clear the hi-res screen and have the program repeat for you what you just did. This makes for interesting demonstrations and meetings. It is also, as mentioned earlier, the way in which you reproduce your screen graphics on a digital plotter.

The replay files are all accessed by a "REPLAY" disk. This disk contains the specialized programs to reproduce the slide shows and the graphics. You are allowed to purchase as many replay disks as you wish.

You will also need to purchase a separate replay disk for each of the digital plotters you wish to use.

You are also told that you can edit the replay files so that you can make them do special things. However, there are no specific instructions or examples in the documentation. There are two pages of comments, but they do not have illustrations nor do they use examples to show how doing one of the edits makes a specific change in the replay files. That is more of the learning by doing philosophy of the Prime Plotter.

The Prime Plotter at Work

The program boots to a master menu which gives you the status of the program and its various modules. You can directly get to some of its special utilities, change drive/slot designations, change working modules, reboot, to go the main line of the program from the initial menu.

The main menu looks like this:

<ESC>:<->:<T>:G:D:S:E::P:235: 1.1

MAIN MENU :
1.*PROGRAM
2.*DATA MGT
3.*FORMAT
4.*GRPH(II)
5.*LABELS
6.*GRAPHICS
7.*HELP

The top line and the main menu words are in inverse. You can access the items using the cursor or typing the number. The * means that there is a set of sub menus under that menu. The Prime Plotter calls those "Branch" menus.

The commands listed across the top work in some menus and not in others. If you use the cursor, some of them don't work. When you are in the branches, pressing ESC always gets you back to the main menu. "T" allows you to toggle in many of the sub menus. That toggle is important. Remember those 26 menus. You need one menu to work with the X axis data and another menu to work with the Y axis data. You get to those by toggling between them. You really need to watch the screen to make certain where you are and what you are doing. One of the top commands displays storage status, the other draws a frame around the graphic screen. "P" dumps the graphic screen if you have the correct printer connected, and 235 clears the graphics screen so you can start over.

Program

Item number one is the program menu. From there you get another menu which reads:

1.MASTER
2.USER I/O
3.FRMT.MDL
4.RESET
5.EDIT
6.UTIL'S
7.REPLAY

As an example of the menus upon menus, here is #2, the user I/O. Pressing the "2" adds this to the middle of the screen:

(1<>2)SELECT :
[1] [2]
LOAD:SAVE:

That means a 1 loads something and a 2 saves something. Pressing a 2 causes a horizontal menu to appear:

(1<>5)SELECT :
[1] [2] [3] [4] [5]
RPLY:GPIX:CPIX:TEXT:DATA:

Does that make sense? It says that you may select between numbers 1,2,3,4, or 5. 1 will select a previously saved Replay file. 2 will load a graphic picture. 3 will load a condensed graphic picture. 4 will load a text file. 5 will load a data file. Selecting a 1 causes the program to ask:

CONFIRM Y:

Then you are asked:

NOW (Y/N)

This is where I start to get bugged. I selected a menu item. I confirmed that menu item. Now the *&|\$@%\$ program wants to know if I want that now. Perhaps I really wanted it in 20 minutes. Why on earth is this response here? Perhaps you can tell me. And this is a small example. There are parts of the program where there is an additional confirmation requested. When I answer yes to the now I am asked if I would like a:

CATALOG (Y/N)

Yes shows the catalog and prompts for the file name. Typing in the appropriate name, since this was a replay file, causes the original graphic which I produced to be recreated on the Prime Plotter screen.

Building a Graph

Meanwhile, back at the main menu, we would select the #3 option for FORMATTING the screen. Selecting that menu only gets us to another menu. It looks like this:

XY FORMAT :
1.*FRAME
2.*AXES
3.*TICKS
4.*GRIDS
5.*GRPH
6.*DATA

Selecting 1 will allow us to put a frame in around the XY display. It brings us to another menu.

XY FRAME :
1.FRAME 40-260:30-160
2.FRMT/BLD ALL : 1
3.COLOR WHT1:
4.>PLOT

What this says is that selecting 1 will query you for the pixel locations for the frames. Selecting a 2 will set the width of the frame line. Selecting a 3 will select the color of the plot line from a horizontal menu with all of the possible colors.

Selecting a 4 will cause the frame to be plotted on the screen. Then after you see the plot you are queried as to yes or no for the plot. If you answer no, the frame will be erased and you will return to the menu. After you set the X and Y axis lines, you press a return to go back only one menu. An ESC always brings you back to the main menu. Then a 2 would bring a menu which is a toggle menu which controls the titles and other features associated with both the X and Y axis. It looks like this:

```
AXES MGT. : X AX. <-> Y AX.
1. FORMAT      REG. :
2. SCALE        0->10:1
3. LOC.         YB : 160
4. BLD/COL     1 WHT1
5. AX TITLE    25:HBLD:THE X AXIS
6. *TICKS
7. >PLOT
```

The words AXES MGT and X AX. are in inverse. Pressing a T switches the axis to the Y side. To use this menu you would set your formats, adjust the scale, say where every thing should start, say what kind of type of colors and line size. When you enter in the title you go through a series of questions concerning how many pixels away from the axis you wish the titles to be as well as what type of title do you wish as well as the actual title themselves.

If you want tick marks, you go to another sub menu through item number 6. The tick mark sub sub sub sub menu then lets you talk about where and why and how they should look. It is in that menu where you add the labels you want for each of the Axes. Remember that the titles are one menu back. These are the labels for the graph itself. This menu, which I have not shown, has two separate plotting options. One for labels and one for ticks. When you want to plot the menu you chose number 7. Then you can have two additional choices, Axis or Labels.

The program goes on and on and on in that vein.

Summary

The Prime Plotter is, in my opinion, the best of these type of combined plotting and graphic display programs I have used in the Apple DOS environment.

The Prime Plotter is, also, the most complicated program I have ever used. The multitude upon multitude of menus make for a very difficult time in learning to use the program.

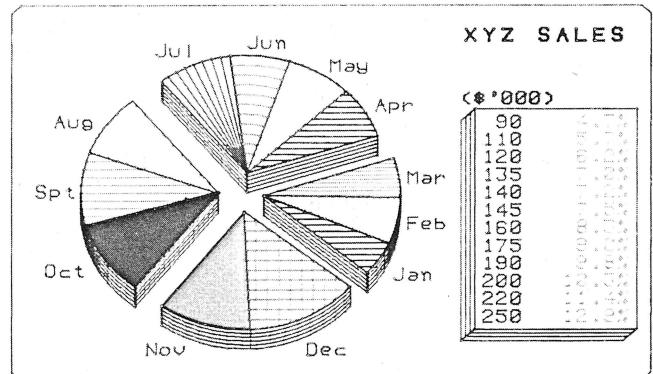
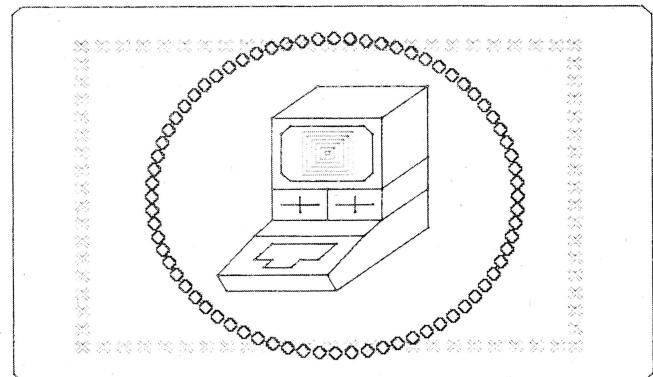
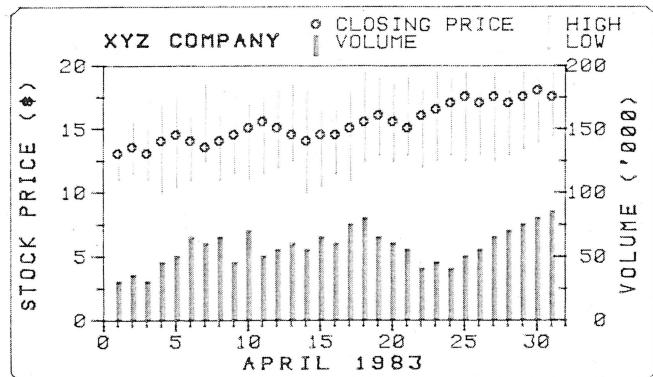
The Prime Plotter is not a simple program for simple needs. It works in and solves some very tough business related problems.

Would I recommend purchase? This is a tough one. Yes, if you are willing to take the time and have the patience to deal with this very odd way of having a user interface. No, if you have limited patience, a low boiling point, a sensitive frustration level, and are against copy protection which may cause your disk to not boot occasionally and make you wonder from time to time if you really have a program operating.

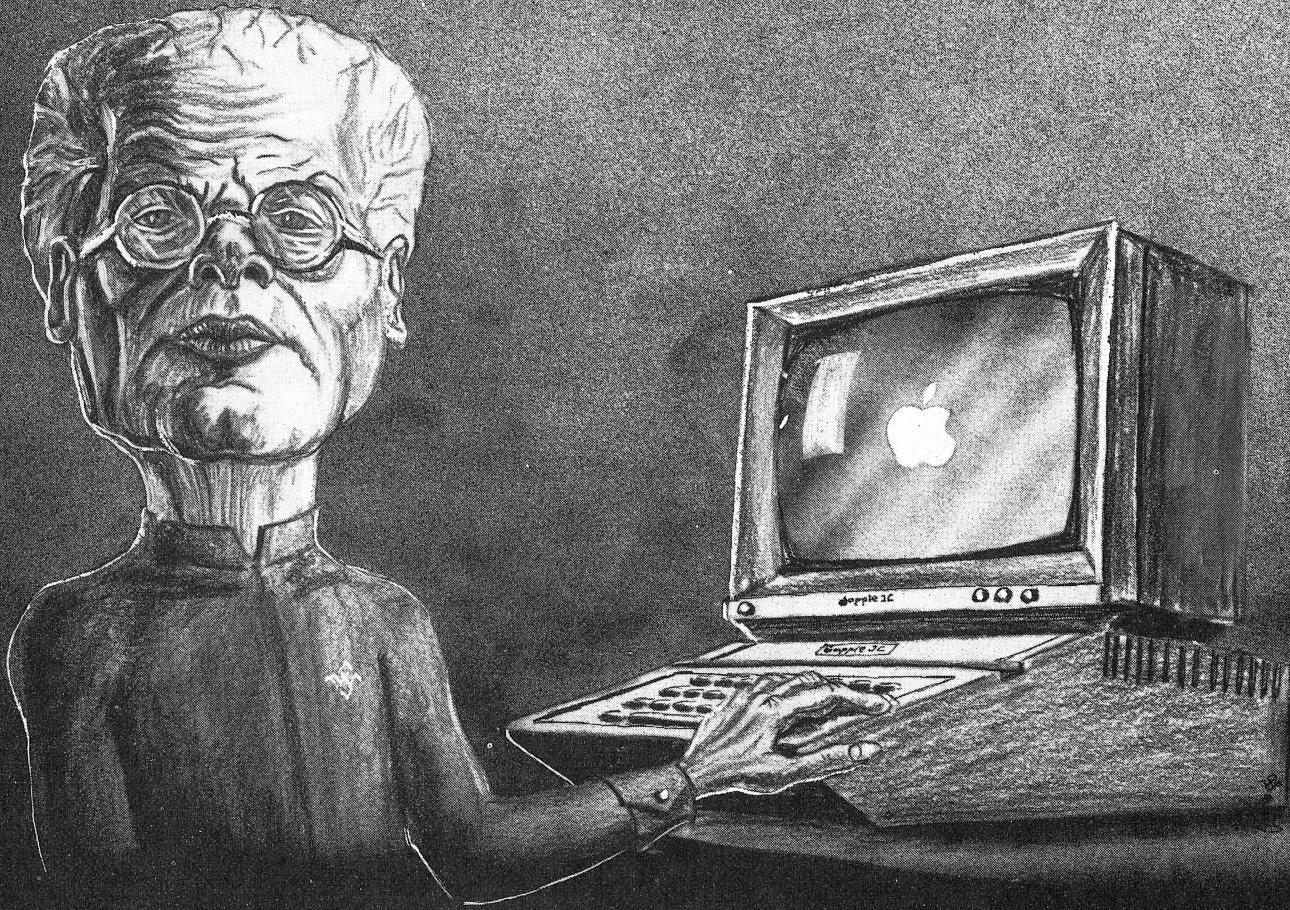
NOTE: This was probably the most difficult review I have ever written. Over the last six months I go from despising the program to thinking that it is the greatest thing since sliced bread. I was quite put off by the attitude of the folks I talked with during the review process. I hope that that human inter-

face did not color my perceptions of the program. I also do not like to be told that things are going to be sent but they never show up. I also do not like being argued with about a problem. I assume that I know when my plotter works and I do not need someone telling me that their program is perfect, therefore I must personally be at fault. I make the assumption that if I, a reviewer, is treated that way, then what will they do to you, the purchaser? Maybe I'm wrong. Let me know of your experiences.

Examples Of Graphics Drawn With Prime Plotter



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A Dvorak Keyboard For Your Apple ///

by Kevin Everett FitzMaurice

The unfortunate story of the QWERTY keyboard layout has been the subject of many articles of late. For those of you who have not heard the story, let me fill you in on the highlights.

Once upon a time, there was an invention that promised to greatly improve the readability of documents. However, there was a major problem getting people to accept the use of this new machine. The reason was that when people typed on the machine they typed too fast for it and the keys jammed. To solve this problem, the manufacturers developed an arrangement of keys that made it as difficult as possible to type; the design separated the most-used letters, so that their type bars wouldn't hit each other as they swung up to the paper in their turn. Now, people could not type faster than the machine could handle it, and the machines started selling very well.

Shortly thereafter, the mechanical problems were solved, but the QWERTY arrangement had already become "the standard". Some people are never satisfied with convention, and try to improve upon it. Such a person was Dr. August Dvorak. In his statistical study of the QWERTY arrangement, he found that the manufacturers had done so well, that a random arrangement of the keyboard was more efficient than the QWERTY. Professor Dvorak spent a lot of time developing an optimum keyboard layout for people, and originally proposed it in 1943.

Unfortunately, his arrangement did not concern manufacturers any more than the idea of changing our funny English spellings to a logical phonetic standard does. His layout is known in various forms as the Dvorak arrangement, the Dvorak Simplified Keyboard (DSK), and the American Simplified Keyboard (ASK). Very recently, there has been approved a standard version of the Dvorak keyboard arrangement by the American National Standards Committee.

The fastest typist in the world, Barbara Blackburn, uses the Dvorak keyboard, and never could learn the QWERTY arrangement because it was so illogical. Today, more and more people are learning to type, and many, out of frustration with the inane QWERTY layout, have found that computers can be modified by the owner to the Dvorak.

What follows is the conversion process to change an Apple /// keyboard to the Dvorak arrangement. When we are done the keyboard will look like FIGURE 1. This is not in conformance with the new standard, but is off only by a few minor points.

Many still do not realize the genuine advance that the Apple /// is for computers. This is the first software definable machine. Any part of the system from its keyboard to its operating system can be changed from diskette. Apple being, as usual, in the forefront of personal computers has for years included a file for the Dvorak keyboard on the Utilities Data diskette with every ///. If you follow the step by step instructions below you will only have to pop the key caps to move them around to their new positions.

Making the Change

In order to change your keyboard layout, first boot your UTILITIES program in the built-in drive. From the main menu choose option "S - System Configuration Program (SCP)" by either typing "S" or moving the cursor to the "S" option with the arrow keys and hitting the return or enter key. From the SCP menu first choose option "R - Read a Driver File". Here you want to load your SOS.DRIVER file from the program (Apple Writer) you want to change, to the Dvorak keyboard.

Since I use one set of drivers for all my software, I arbitrarily choose to put in my ACCESS /// communication disk into the built-in drive in place of the UTILITIES. Then I accepted SOS's suggestion of ".D1/SOS.DRIVER" as the correct pathname by hitting the «RETURN» key. Once the

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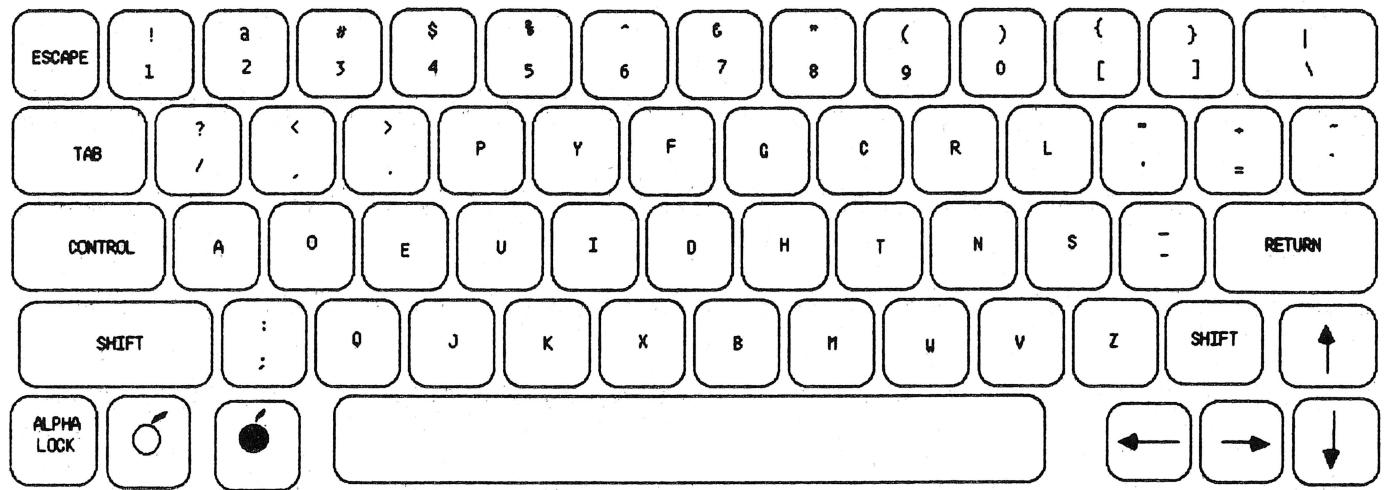
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DISK DRIVES DISK DRIVES

Apple ///

Dvorak Keyboard Layout



Lisa Silverman

Illustration #1

drivers are read into memory and are displayed, you want to go back to the SCP menu by pressing the «ESCAPE» key.

Now your second choice from the SCP menu will be “C - Change System Parameters”. This puts you in the CURRENT SYSTEM PARAMETERS menu. In this menu choose option “4 -Keyboard Layout”. Now you get a prompt for the pathname of the keyboard layout you want. Apple thoughtfully included a file on the SYSTEM UTILITIES DATA diskette called KEYBOARD.LAYOUT/DVORAK. So remove your program disk, and put your SYSTEM UTILITIES DATA disk into the built-in disk drive. Now type, at the cursor position, “.D1/KEYBOARD.LAYOUT/DVORAK”.

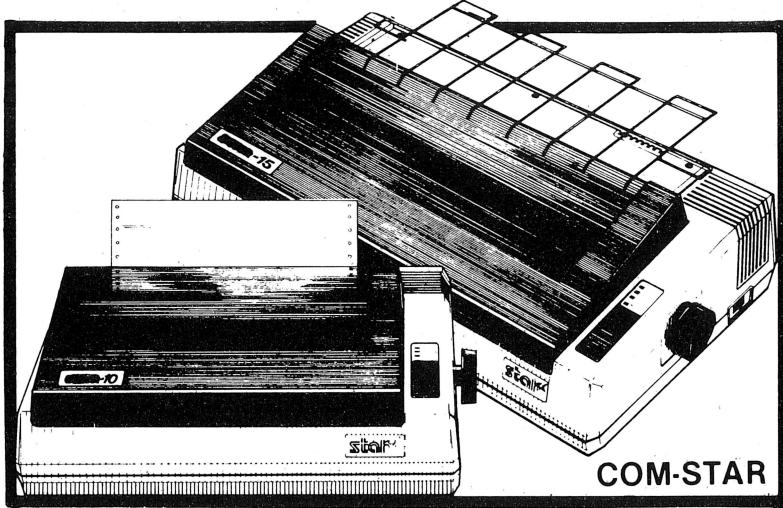
Once you see “DVORAK” displayed on the screen; remove the DATA disk, and return the UTILITIES disk into the built-in drive. Now push the «ESCAPE» key to return to the CURRENT SYSTEM menu, and hit escape once again to return to the SCP menu. In the SCP menu choose “G - Generate New System”. You will now see the message “System Validation in progress”. Next, if you did everything correctly you will see the message “-- System Validation Completed --”. SCP then prompts you for the file name to store the new system on and suggests “.D1/SOS.DRIVER”.

Now put your Apple Writer /// disk in the built-in drive in place of the UTILITIES and hit return. SCP will ask if you want to write over the SOS.DRIVER file that is already on your disk. You respond with a “Y”, and your new system is put on the disk. Now all you need to do is remove your

AppleWriter /// disk, and put in your Business BASIC disk, or any disk with a SOS.DRIVER file on it with which you want to use the Dvorak keyboard. Next press «RETURN», answer “Y”, and it too will now be configured for Dvorak.

In the future, you will only need to copy a SOS.DRIVER file from any one disk that has the Dvorak keyboard to any new ones on which you want it. Of course, you only have to load a disk with the proper keyboard layout to use either the Dvorak or the QWERTY. For example if you like the Dvorak, but some unreasonable person wants to use the QWERTY, all you need do is to have a copy of your programs with the Dvorak SOS.DRIVER for yourself, and one with the QWERTY SOS.DRIVER for the die-hards. It is also easy to move the key caps around, as they just press in place. I use the Dvorak keyboard with Apple Writer ///, ACCESS ///, Business BASIC, and Apple /// UCSD Pascal. Apple claims that ACCESS /// is the first, and so far the only communications software package to support the superior Dvorak keyboard. (*Gk hsd; kavd a ngk—er, it does take a bit of getting used to, though.—PCW.*)

Apple has apparently also provided a means for converting the Apple //e to the Dvorak. It is a hardware rather than a software fix, as the Apple //e is still far behind the ///. I saw it in the Spring '83 issue of *Quick Strokes*. For more information contact *Quick Strokes*, POB 643, West Sacramento, CA 95691, and or Virginia deGanahl Russell, 11 Pearl Street, Brandon, Vermont, 05733.



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Converting Integer Programs To Applesoft

by Lee Reynolds

Now, switch to Applesoft, and EXEC the text file into memory. You will then have each of the original Integer program's statements translated into an Applesoft statement. Well, roughly translated, anyway. It probably won't run as is, because some of the Integer lines might be illegal in Applesoft. The two "dialects" of BASIC have different syntax, but you have those statements in memory because Applesoft doesn't do any syntax checking until you try to RUN the program. (Integer BASIC, on the other hand, does its syntax checking immediately when a statement is typed in, or EXEC'd in. Thus using this technique to convert from Applesoft to Integer is much more difficult.)

Now all you have to do is LIST the new Applesoft program and then change any statements which won't work because of syntax errors, etc. This is where the real work comes in, although you might be lucky enough to be trying to convert a program which requires few, if any, changes. The remainder of this article will cover all the types of changes I could think of which you might have to make. (If any readers come up with additions to the list below, I'm sure we would like to hear from you.)

The following list is as complete as I could make it. It is unlikely, however, that your program will require all of them. Many of the items at the end of my list concern rather technical programming "tricks" that most novices would not use. I have attempted to compile the list of items in order of decreasing likelihood of your encountering them. Thus, as you progress down the list, it becomes less and less probable that for the average Integer program you'll have to make that type of modification.

1. Long Variable Names

Both Integer and Applesoft programs allow long variable names (most BASICs allow only 2-character names.) However, although Integer BASIC distinguishes between names using the entire length, Applesoft uses only the first two characters. Thus, if the original Integer program used two variables named, say, PLAYER and PLACE, you'll have to change the name of at least one of them in order for the Applesoft version to work properly.

2. Variable names containing Applesoft key words

"DRAW" and "SINGLE", for example, could be perfectly valid names in an Integer program, but not in Applesoft ("SINGLE" because it contains the letters for the "SIN" function.)

3. Integer Divisions

Watch out for any use of division in the program. Consider the following example:

$$100 \text{ YX} = \text{XY}/10 + 10^*(\text{XY}-10^*(\text{XY}/10))$$

The above statement in an Integer program reverses the digits of a two-digit integer XY and stores them as YX, since Integer division truncates to the nearest integer. In order for it to work in Applesoft, you'd have to rename the variables to XY% and YX%, or else use the INT function.

4. Dimensioning of Strings

In Integer programs, each string must be DIMensioned to the largest number of characters it will contain. (For example, "DIM A\$(100)" would allow up to 100 characters in the string A\$.) In Applesoft, you only dimension string Matrices! (In that case, "DIM A\$(100)" would allow up to 100 strings A\$(1), for I=1 to 100, each with up to 255 characters.) Thus, you should remove all DIMs of strings in your conversion to Applesoft.

5. String Functions

In Integer, if you have declared a string A\$ by means of a DIM statement, then the expression A\$(I,J) references character positions I to J of A\$. For example, if I = 1 in the above expression, you reference the same characters as would be referenced in Applesoft by LEFT\$(A\$,J). All expressions such as A\$(I,J) will have to be changed to equivalent expressions involving the Applesoft functions LEFT\$, RIGHT\$, and MID\$.

The syntax for string concatenation is also different between the two languages. An Integer program might have a statement like the following, for example:

```
100 A$(K) = B$
```

This would cause character positions K and onwards of A\$ to be changed to whatever characters are in B\$. To accomplish something similar in Applesoft ($K > 1$):

```
100 A$ = LEFT$(A$,K-1)+B$
```

Note that you cannot assign a value to a LEFT\$, MID\$, or RIGHT\$; that is, a statement like

```
102 RIGHT$(A$,7) = "ORCHARD"
```

is not executable. Use instead

```
102 A$ = LEFT$(A$,6) + "ORCHARD"
```

6. Multi-statement Lines with IF statements

Suppose you had the following line in the Integer program;

```
100N=A : IF C>D THEN N=B: M=N+1
```

This statement will not work the same way in an Applesoft program, for when C is greater than D, M will not equal A + 1. The reason is this: when an Integer IF test fails, the next statement is executed, and this statement may be on the same line. When an Applesoft IF test fails, the next line is executed, not the next statement.

This example could be changed as follows in order to work correctly (assuming there is no pre-existing line 101):

```
100 N=A : IF C>D THEN N=B  
101 M=N+1
```

7. "Not equals" tests in IF statements

In Integer BASIC, the expression "A#B" means "A not equal to B". This must be replaced in Applesoft by "A<>B".

8. RND function

Both Integer and Applesoft have a RND function, but they operate differently. RND(X) in Integer BASIC gives a random integer between 0 and X. RND(X) in Applesoft gives a random real number between 0 and 1. To convert an Integer expression RND(X) to its equivalent in Applesoft, use INT(X * RND(1))

9. MOD function

There is no MOD function in Applesoft, but it can be simulated, perhaps with a Defined Function. The Integer statement:

```
100 M = N MOD A
```

sets M to the value of N modulo A; thus M will be the integer between 0 and (A - 1) inclusive which is the remainder from dividing N by A. Thus 12 MOD 3 is zero; 13 MOD 3 is 1, 14 MOD 3 is 2, and 15 MOD 3 is zero again. The Applesoft equivalent of N MOD A is

```
(N - INT(N / A) * A).
```

Perhaps your program computes many values of numbers modulo 16. Then you could define a function in the Applesoft version:

```
10 DEF FN MOD16(N) = N - 16 * INT(N / 16)
```

Then statement 100 would become:

```
100 M = FN MOD16(N)
```

10. TAB and HTAB

There is a TAB function in Applesoft, but it has a different use than the Integer version. So you should replace all Integer "TAB X" statements by "HTAB X" statements (where X may be an integer constant, variable, or expression.)

11. INPUT Statement with Comma

Consider this Integer Example:

```
100 INPUT "YOUR AGE?", AGE
```

In particular, note the comma following the second quotation mark; this will not be accepted in an Applesoft program. You will have to change the comma to a semi-colon.

12 GOTO or GOSUB with an expression

In Integer you can follow a GOTO or GOSUB with an expression, as in this example:

```
100 GOTO 100 + N * 10
```

(The expression following GOTO or GOSUB can also be a single variable, such as in "GOSUB X".) Applesoft, however, allows GOTO or GOSUB only to defined line numbers. (Yes, there's a way around it using some machine language routines, but not here, please.)

In the example above, if N is 1, the program will GOTO line 110. If N = 2, then Line 120, and if 3, then 130. Applesoft's equivalents are ON..GOTO and ON..GOSUB. Assuming N varies between 1 and 3, the Applesoft line looks like this:

```
100 ON N GOTO 110, 120, 130
```

The calculated GOTO (GOTO (X + Y * 10)) is not directly possible in Applesoft. Definite values for our variable N in the ON..GOTO must be figured in advance.

13. Use of the ASC function

Both Integer and Applesoft have the ASC function, which yields the integer value of an ASCII character. But the values yielded are different, which could imply logic changes in the program in order for it to work properly. Where we assume that A\$ is a string or character, keep in mind that the value of ASC(A\$) in an Integer program is 128 MORE than the value of ASC(A\$) in Applesoft. Thus, consider this statement in the Integer program:

```
100 X=ASC(A$) : IF X<176 OR X>185 THEN PRINT "NON-NUMERIC!!"
```

To perform the equivalent test for A\$ being an ASCII zero through nine, in Applesoft, test for X between 48 and 57.

14. Storing Machine Language in Page Zero

There are some Integer programs that POKE short machine language routines into page zero locations between 0 and 31 (decimal). For example, the "Biorhythm" program in the "Red Book" POKEs a routine that's used to produce tones on the Apple's speaker into that memory area. (The "Red Book" came with the early Apple II's instead of a reference manual.) This won't work in Applesoft, because Applesoft itself uses almost all of page zero. ("Page Zero" is the first 256 locations of the Apple's memory, numbered from 0 to 255.) The only page zero locations not used by Applesoft (or the Monitor or DOS) are: 6 through 9 and 25 through 31.

In order to change a program using a page zero routine to work under Applesoft, you would have to do the following: (1) disassemble the routine using the Monitor "L" command; (2) decide where you want to relocate it ("Page Three", starting at hex location \$300 -- which is decimal 768 -- might be a good place); (3) change any absolute references in the routine; (4) modify all the POKE statements that place the machine language routine into memory; (5) modify POKE statements that pass arguments; and (6) modify the CALL statements.

15. Use of LOMEM and HIMEM

Some Integer programs have a LOMEM statement within the program to move the Symbol Table (where variables, arrays, etc. are stored during the RUNning of the program.) Normally, Integer BASIC stores the Symbol Table beginning at location 2048. By setting LOMEM higher than this, machine language routines can be stored there instead, or else "Text /Graphics Page 2" can be used. The LOMEM statement in Applesoft will not work this way. Applesoft programs are normally stored beginning at location 2049, the Symbol Table follows immediately after the last program statement, and LOMEM is automatically set to the end of the program. This means LOMEM cannot be set to a lower value, because otherwise the Symbol Table would clobber part of the program. The best way I know of getting around this problem is to use a utility called &LOMEM: which, when called inside an Applesoft program, will move the program UP in memory. This utility is described in the first issue of **Apple Orchard** magazine.

Another problem can develop with the differing uses of HIMEM between Integer and Applesoft. Integer programs are stored in memory from HIMEM downwards, and if the interpreter executes a HIMEM statement which lowers the value of HIMEM, it will move the program downward below the new address. This is not true in Applesoft. Moreover, if HIMEM is lowered in an Applesoft program using strings, they will be "lost", because Applesoft stores strings from HIMEM downwards.

16. Use of Integer-BASIC-Specific Page Zero Locations

Some Integer programs make use of the following Page Zero locations, which the Integer BASIC interpreter itself uses for its own purposes (all addresses are in decimal):

Location	Use
74 and 75	current LOMEM value
76 and 77	current HIMEM value
202 and 203	start-of-program address
204 and 205	end-of-Symbol-Table address
208 and 209	address of last-reference symbol

The locations put to similar use by Applesoft programs are in the following table:

Location
103 and 104
115 and 116
103 and 104
109 and 110
131 and 132

However, if you are trying to convert an Integer program that makes use of the locations in the first table, beware! A straight substitution of the "equivalent" values in Applesoft may not work. The program logic changes may be quite difficult to do, and could depend upon the particular case in point. In some cases it may not be possible to do something equivalent in Applesoft, because each language has its own peculiar manner of structuring memory.

17. Variable LIST statement

It is possible to insert an "illegal" statement like the following in an Integer program:

100 LIST LINE1, LINE2

The method for doing this has been described elsewhere (for example, see "Integer BASIC Post-Editor", by Ray McVay, in the Mar/Apr '80 issue of **Call -A.P.P.L.E.**)

Such a statement won't work in Applesoft! The only arguments accepted by Applesoft for the LIST command are actual line numbers, not variables.

18. CLR and DEL statements

These "illegal" Integer BASIC statements can also be inserted in a program by the method alluded to above. The corresponding Applesoft command for "CLR" is "CLEAR". Also, the DEL statement works differently from its Integer counterpart in that program execution will immediately STOP after the lines have been deleted, and to delete a single line you use a different syntax. For example, the Integer statement "DEL 20" would have to be "DEL 20,20" in Applesoft.

19. Use of Integers > 32767

Integer programs normally are limited to manipulating numbers less than 32768, but some programs must make use of values that can be greater than 32767 (for example, addresses in a 48K machine.) In order to reference such values, the Integer program must break the value down into low and high bytes and use PEEK and POKE. As long as your Applesoft version does its functions in real arithmetic, this sort of thing is usually unnecessary, and the logic can often be greatly simplified.

20. POKEs into the Symbol Table

You might encounter Integer programs that simulate the Applesoft CHR\$ function in this manner: (1) define a string as the first variable in the Symbol Table, so that its location is known. (E.g., if A\$ is the first-defined symbol in the program, and LOMEM is not modified, then the location of the first character of A\$ is known to be at 2053.) (2) POKE, an ASCII value converted to decimal into that known location. (3) Then PRINT A\$, etc.

This kind of thing can accomplish other purposes, too, if you know what you're doing. But logic like that doesn't convert easily into Applesoft because the program's Symbol Table doesn't have as easily-defined a structure or location in memory. In the case of simulating CHR\$, it isn't necessary under Applesoft, of course; just use CHR\$ directly and you'll probably simplify things considerably. But other cases might not be so easy to dispose of. Here is a slightly more difficult example: I've modified a couple of Integer programs which set

up a 256-byte buffer at the beginning of the Symbol Table, to be used by the DOS read-write-track-sector (RWTS) routine. In the Applesoft versions the buffer was allocated at the start of the Symbol Table by this means: PEEKing at location 106, incrementing it by 1, then POKEing it back into locations 106, 108, and 110. (See the Applesoft manual, pages 140 and 141, for an explanation of what this is doing.)

21. CALLS to BASIC Interpreter Routines

A few programs CALL routines inside the Integer BASIC Interpreter itself to accomplish some purpose or other. For example, the RUN function can be performed by a CALL -4116 in Integer, and the LIST function by CALL -8117. For cases like this, what is required is highly specific knowledge of how the Interpreter routines work (and mine is nowhere near complete.) For the "RUN" example, you would merely substitute a CALL 54630 in Applesoft; I don't know what to substitute for the "LIST" example, if indeed there is any CALL that can be substituted at all.

This concludes my list of possible modifications to make when converting an Integer program to Applesoft. I hope you find it of some use when you have the occasion to do this.



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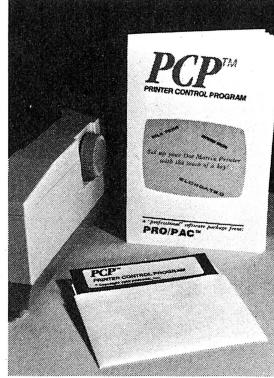
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Floppy Card ///

Review

by
Dan D. Vanmeister
and
Sid Hymes

Rana Systems
21300 Superior Street
Chatsworth, CA 91311

Need to back up large files from a hard disk on your Apple ///? Detest having to use 35 or more 5½-inch mini floppies to do it? Do you have a need to create large files of information on one disk? How large? How about 1.2 Megabytes on one disk? That would allow you to back up a Profile using only 4 disks.

Many people use a floppy disk based program and like to put a full year's records on one disk. Reports can then be produced without need for merges from one disk file to another. For a small to medium firm, a full year's invoices can come out to be about 800K, or a little over five 5½-inch disks' worth.

We've heard about hard disks, and about exotic high-density storage floppy disks by Sony, Apple and others. But an alternative that hasn't been talked about too much is the standard 8-inch disk used with word processors and some computer systems all over. But the problem is the interface between the Apple // and 8-inch disk drives.

The problem is solved with Burtonix's introduction of the "Floppycard //". It interfaces with standard 8-inch double density/double sided drives for 1.2 Megabytes. That's the equivalent of seven 5½-inch diskettes on one 8-inch disk. This card also has the ability to support the Amlyn 5½-inch 5.5 Megabyte cartridge drive and the C. Itoh 5½-inch 1.1 Megabyte floppy drive.

After receiving the Floppycard //, we obtained two Tandon 8-inch thin line drives. It was explained that these drives can be configured so that they are not

continually running, turning on and off like a standard drive. It seems a great number of 8-inch drives turn on their motors when the power is supplied and just keep 'em spinning until the power is turned off.

The Floppycard // directions for connecting the drive to the card were straightforward. The owner's manual gives a complete description of the pin-outs for the 50 pin connector and recommends that these be cross checked with the pin-outs of whatever drive is purchased before connecting. The manual supplies jumper configurations for Shugart SA800, Qume & Shugart 850/851, Tandon TM848-1 & -2, and the Amlyn Drives.

The Tandons are Double Sided/Double Density (DS/DD) for 1.2 Megabytes per drive and Butronix supplies software which allows you to format a disk as Single Density, Double density, and Enhanced Double Density. After checking the pin-outs, connecting the cable and installing the card in the Apple //, you then install the proper device driver. Using the Configuration Program on the Systems Utilities disk, generate a new SOS.DRIVER that now includes the proper device driver for the 8-inch drive. In the case of the Tandons, the driver is labeled /BURTRONIX/FLOPPY.SLIM because they are thin-line drives. The Change System Parameters option is then used to designate the card slot. The driver allows for up to 4 disk drives designated ".F1 to .F4", which could total 4.5 Megabytes of storage using 8-inch drives.

The Systems Utilities was then rebooted, a blank DS/DD disk was installed into the 8-inch drive, Format was brought up on the screen, .F1 (drive one of the 8-inch system) was designated to be formatted: the screen then displayed:

Warning: you are about to format a large disk. Please make sure this is appropriate.

It then took about 100 seconds to format 1.2 megabytes. When listed, the disk had 1995 blocks free. If needed, information is given as to how to edit the drivers for "seek speed", density, motor on or off, sector interleave and other tables.

In order to test the setup, we used VerSaForm from Applied Software Technology, a program that makes use of large disk based files. During one part of the program you are asked how many blocks you wish the file to be. We answered "1995 blocks", and held our breath. No need to worry; Floppycard created a 1.2 megabyte file without a hiccup. As an example of capacity, if you were using it for a simple mailing list of 128 bytes per record, a total of over 7900 names could be stored on one disk, instead of 1040.

CP/M Installation

Creating a system usable under CP/M was relatively simple. The manual mentioned that some minor bugs exist in Release 2.2 of CP/M for the Apple //, which Apple is aware of and is correcting. These limited the use of the COPY.COM program between disks of different sizes. Burtonix also provides a small patch program called CPMFIX to prevent system boot hangups caused by having the last DRIVER.SOS file inactive.

Having previously installed Microsoft's CP/M card, some blank 5½-inch disks were formatted and copies made of the distribution disk. Bootable system disks were then created containing the drivers and the more frequently used CP/M utilities such as STAT, CONFIGUR and PIP. Under CP/M, the driv-

er file is called DRIVER.SOS and drives are referenced by letter and colon, such as A: ; four drives (A: through D:) are supported.

Using the CONFIGUR program, the drives are assigned their identities. The built-in drive became A:, the first Apple accessory drive B: and the two 8-inch drives C: and D:. The RESET program is next run; it "sets" the selection and allows reconfiguration of the 8-inch drives for the formats and number of sides desired.

Some 8-inch disks were formatted under extended double density and, using the STAT program, capacities of 1208K (1.2M) were indicated. Read and write tests using PIP were then successfully conducted.

Then the big test. A large program (Attorney's Time and Billing, Bear Computers, Bloomington, IL), distributed on 8-inch disks (IBM 3740 format, single sided, single density) was downloaded to the Apple ///. For those of you who have not experienced the non-Apple software market, hundreds of programs are

distributed in the IBM 3740 format for transportability, and one of your authors is involved in that segment of the market.

Using PIP with the verify option, the seven 8-inch disks were transferred in rather quick fashion, moving approximately 1.5M of information without hangup, problem or confusion. After copying the information, and using a combination of both the source disks and the newly created Apple disks, the program was run under MICROSOFT BASIC. Communications between the Apple and the two different sized drives performed flawlessly, proving that the I/O aspects of the modified Apple drivers were compatible and correctly installed.

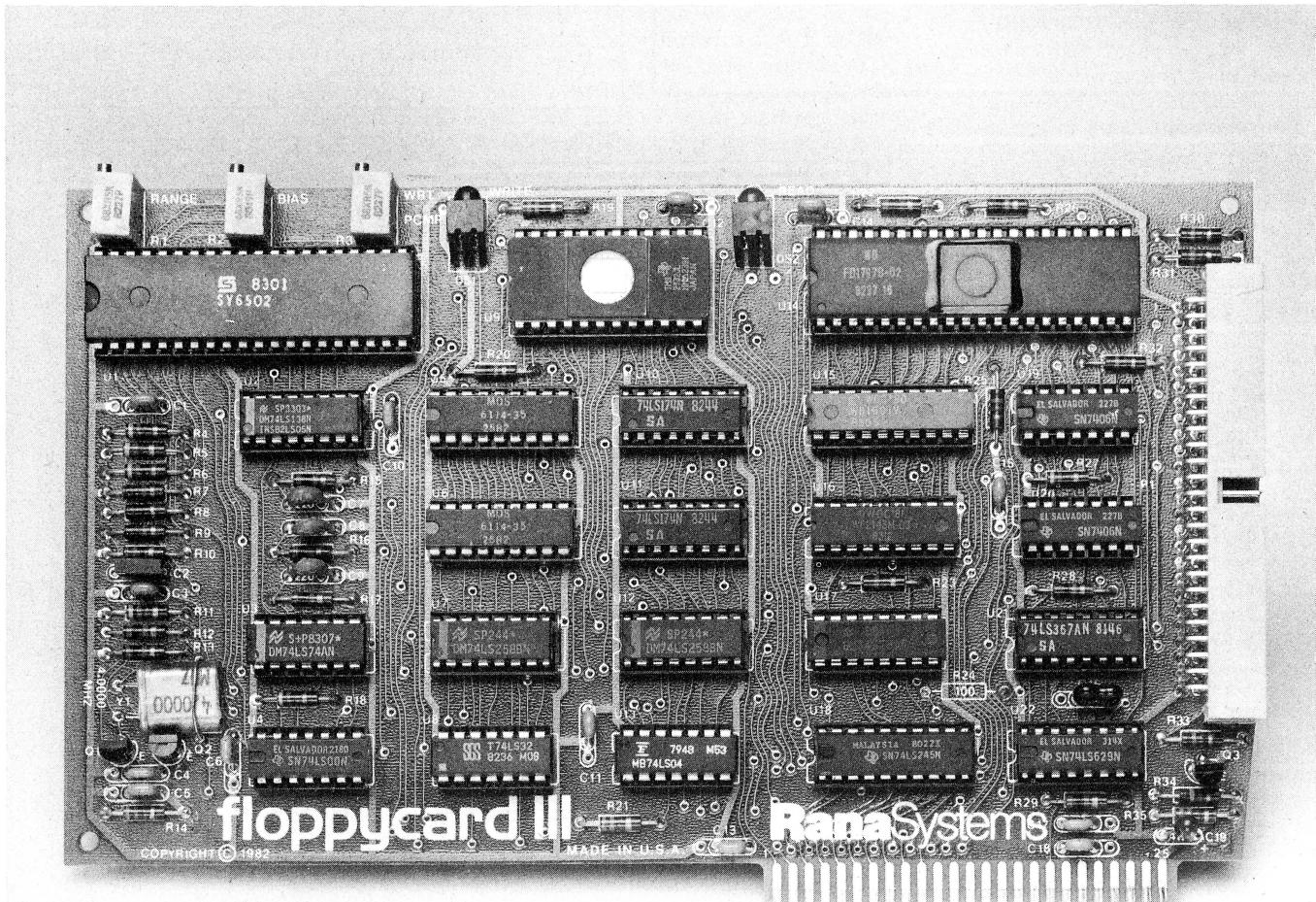
File handling with Softcard /// CP/M using the Burtronix controller card is no different than without it. One must just be careful not to attempt to access a nonexistent or disconnected drive to avoid that most offensive of CP/M's responses, "BDOS error on X: drive". For safety (and sanity), the CONFIGUR program was run after disconnecting the 8-

inch drives, insuring that the no longer active drives were a selection option.

Installation of the Burtronix controller card with one or more 8-inch drives makes available to the Apple /// owner many of the excellent CP/M programs available in the marketplace, and is a useful and valuable alternative to hard disk storage.

The suggested retail price for two thin line drives and the card, is \$2400. That's a bit more than most 5 megabyte hard disks, but consider that the 8-inch disks will store 2.4 megabyte on line. The real advantage is that the upper limit of total file storage isn't limited to the "hard" maximum of the hard disk. When another 1.2 megabytes of storage is needed, the cost is approximately \$7.00 for a new blank disk. The dual drive system also gives you the ability to back up your large files quickly without downloading to more 5 1/4-inch disks.

For some applications, the 8-inch disk drive approach may be the best way to go. The Burtronix Floppycard /// enables the Apple /// user to select that alternative.



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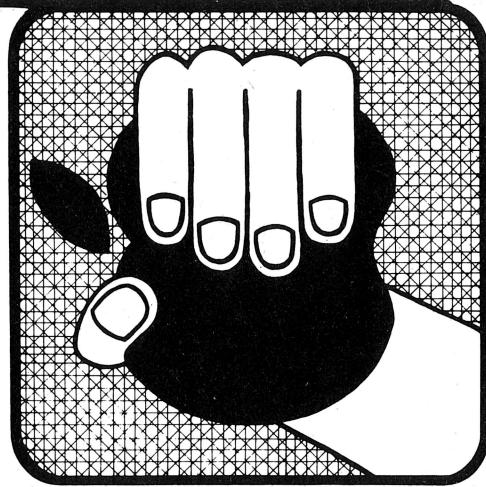
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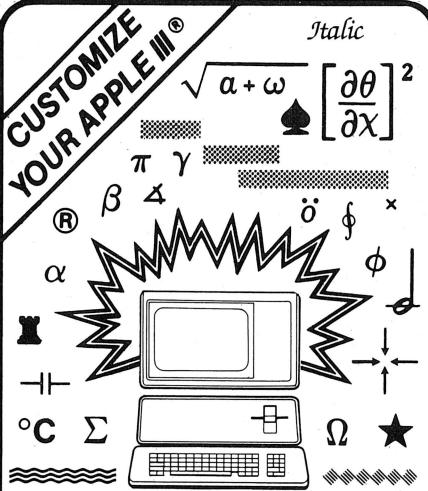
Macwrite, a word processor Macintosh. Features full pull-down menus, font and character size selection, full editing. Placement of tabs, decimal tabs (for column work), indents (and outdents) are all handled by screen "rulers" which can be placed anywhere in the document that formatting changes are required. Cut/paste can move sections of text to other parts of the working document, or to another document. This mechanism also

allows placement of material from other Apple modules into the Macwrite environment. Screen image IS exactly what will appear on printed page. Contact your local dealer.

Macpaint, a creativity tool for Macintosh. Not to be confused with LisaDRAW, this product allows full "pixel editing" of screen generated pictures. Full use of screen-pointer (mouse) allows rapid development of full-screen images. Many brush shapes are provided, including an "airbrush" that fills in dots for shading, etc., that must be seen to be appreciated. Fonts are selectable by size and style. Multiple copies of small patterns (user defined, too) can be placed anywhere on screen. Options included to rotate, flip horizontally, vertically, or reverse user selected portions of screen. If last command did something unwanted, simply back out to previous command. Price, both Macwrite and Macpaint, sold together, \$99.00. Contact your local dealer.

Apple Writer /// has been enhanced, with improved cursor control, revised documentation, an interface to Apple Speller, a template for the Apple /// computer's numeric keypad to allow single keystroke commands for control sequences, and a separate utilities disk to facilitate file transfers between Apple Writer II and ///, from Mail List Manager, Quick File III and Visicalc to Apple Writer ///. **Apple Speller** /// checks spelling, gives cumulative word count, has menu for single-keystroke commands. Can create additional dictionaries for special terms, names, titles, etc. Hardbound dictionary included. Runs on any Apple /// computer, hard disk recommended (but not required). Both products, together are \$395.00. Apple Writer /// (Version 2.0) sells for \$275.00, and Apple Speller /// for \$175.00. Contact your local dealer.

Update Information: Until April 15, 1984, Apple Writer /// (Version 1.0) customers can upgrade their software to Ver-



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sion 2.0 by sending in their Apple Writer /// master disk, manual and \$100.00 to:
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P.O. Box 306
Half Moon Bay, CA 94019

Apple Graphics Tablet, an electronic drawing board for creating computer graphics, is available again (after certification by FCC). Runs on Apple II family of computers, requires single disk drive, color monitor recommended (but not required). \$795.00. Contact your local dealer.

LisaTerminal data communications software, allows the Lisa to emulate VT100, VT52, and TTY terminals and exchange information, via modem, with computers supporting asynchronous protocols. Users can gain access to remote mainframe computers and information services. Program allows display of information from different mainframes in multiple windows on the Lisa's screen, with each window emulating a different mainframe. Additional windows can run other Lisa application programs simultaneously! \$295.00. Contact your local dealer.

Apple Cluster Controller, for Lisa computers, converts System Network Architecture/Synchronous Data Link Control (SNA/SDLC) or Binary Synchronous Communication (BSC) protocols to asynchronous protocols. It comes equipped with either three or seven serial RS232 ports, allowing combinations of up to seven Lisas or serial printers--to be attached to the IBM 3270 network. Three port price, \$4500.00, and seven port version is \$7000.00. Contact your local dealer.

SchoolBus, a disk and printer sharing system for schools to use with Apple II family of personal computers. It eliminates the need for a disk drive and printer at each student's computer. Allows direct communication between the students' and teacher's computers, and enables the teacher to monitor each student's performance. System uses plug-in cards that, when linked together using the system cables, allow up to 30 student computers in one location to share the disk drives and printer at the teacher station. The teacher controls all disk handling and access to the shared equipment. Operating system is called BOS (Bus Operating System), is compatible with DOS 3.3 software and commands, and presently supports BASIC programs. Teacher station requires at least 48K Apple, and one disk drive, eight drives maximum. Printer is optional. Student stations require at least 16K Apple computer. Starter kit includes hardware for teacher station and two student stations, student reference cards, manual and teacher reference card for teacher. \$525.00 Add-On kit for one student station is \$175.00. Contact your local dealer.

Pascal Language System, for Lisa computers, makes full use of Lisa's user interface; mouse-based editing, multiple windows, cut/paste functions. Package includes mouse editor, compiler, code generator, MC68000 assembler, linker, debugger, a wide range of utilities, and fully implemented IEEE numeric calculations. A program, Quickdraw, is included to allow developers to write applications that can display shapes, patterns, and fonts. A second release (soon) will include the Lisa Applications Window, a feature that will allow existing applications to be moved quickly to the Lisa "desktop" environment with minimal changes. Apple will replace the first release with the new one for a "nominal fee." Developers will be able to use the Lisa Applications Toolkit, (available soon), to produce fully-integrated Lisa-like applications. \$595.00. Contact your local dealer.

RELEASED AT COMDEX

Rana 8086/2 plug-compatible co-processor and dual disk drive system for Apple II family of computers. Includes; an 8086 microprocessor and 256K co-processor onboard memory, expandable to 512K, with dual, double-sided, eight inch drives (360 Kbytes per drive). MS-DOS operating system. Available March, 1984. Price not available.

Circle HelpCard No. 182
For further information, contact:
Rana Systems
Fran Mulvania
(213) 709-5484

/// E-Z Pieces, for the Apple /// business computer, includes a fully integrated package, with desktop manager, word-processor, database manager and spreadsheet. Desktop manager offers "clipboard" for cut/paste operations, "file cabinet" that keeps track of documents and the devices they are saved on, read files from Visicalc, Quickfile, Mail List Manager, Apple Writer ///, Word Juggler, or retrieve any ASCII text files for program use. Data Base Manager allows up to 30 fields per record, flexible sorting, merging multiple files, reporting in label or table format, performing calculations on numeric data and the program supports totaling. The Spreadsheet allows 999 rows by 126 columns, efficient memory storage of information, variable column widths, and formula editing. The Word Processor screen display shows exactly how text will appear on the document. Page breaks are shown. Text and formatting commands can be hidden. True proportional spacing for all Apple printers. \$295.00

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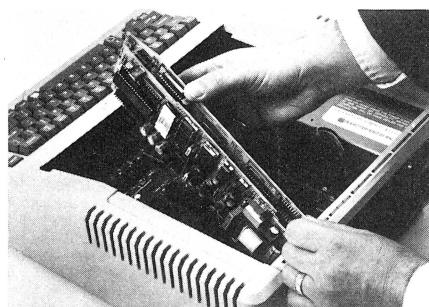
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Roland DG
7200 Dominion Circle
Los Angeles, CA 90040
(213) 685-5141

The Era 2 communications system includes software and a 1200-baud board modem. Installs into the Apple IIe, Bell 212A or 103 compatible. It accommodates full or half duplex transmissions up to 1200 baud, and provides error-free file transfer between dissimilar brand computers using the Microcom Networking Protocol. Auto-answer, originate-answer and pulse or tone dialing asynchronously are provided. Complete with communications software, board modem, a users manual, and a telephone cord. Provides on-line printer control. Maintains up to 33 digits per stored telephone number. Send and receive complete files and set communications parameters such as baud rate, flow control, character format, parity, tabsetting, answer-back, and screen background. Requires an Apple //e, DOS 3.3, 64K RAM, w/80-column capability, from one to a maximum of four disk drives and a printer. Cards supported by Era 2 include the Super Serial Card, Apple Parallel Card, Thunderclock Plus, and Mountain Hardware Clock \$429.00.

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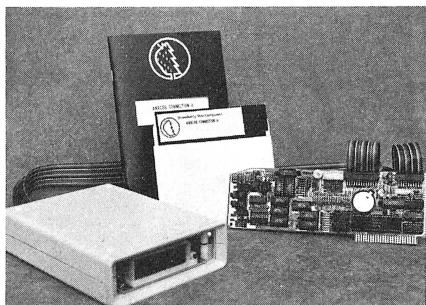
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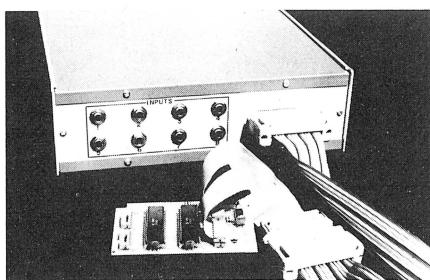
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(408) 736-3083



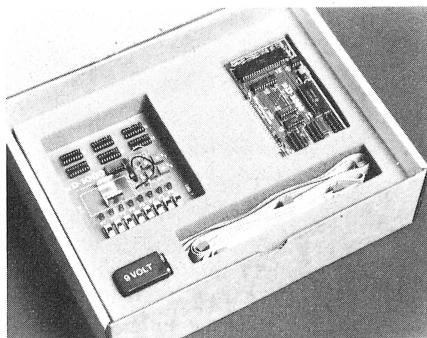
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Circle HelpCard No. 104
Columbus Instruments
950 North Hague Avenue
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(614) 488-6176



The **uD-1000 I/O system** is designed to simplify input/output for all Apple II computers. It plugs into one of the slots and provides eight digital inputs, eight digital outputs and eight analog inputs. A User Interface Module simplifies testing of user-developed hardware and software. The system comes with "The Hook", on a 5.25 inch floppy disk, which allows the use of Applesoft BASIC. Standard BASIC variable names then are used to provide the values of each of the I/O channels. A 40-page manual is included.

Circle HelpCard No. 105
MicroDimensions
4860 East 345th Street
Willoughby, OH 44094
(216) 953-8414



The **Networker** is a single slot, 300-baud modem designed for any Apple II computer. The Networker modem sells for \$129.00. A free, permanent subscription to *The Source* is included. It combines complete modem functions and communications circuitry on one card while providing direct, low-noise, modular telephone connections. A diskette with required communications software is also included. The Source, Inc. is one of the largest communications and information networks available to personal computer users. It offers electronic mail service as well as access to hundreds of computer bulletin boards. It is accessible with a local phone call in 500 major metropolitan areas. Registered members buy services at an hourly rate. This membership offer is valued at \$80.

Circle HelpCard No. 106
Zoom Telephonics, Inc.
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The **CB-141 Color Composite Monitor** gives full color graphics at an affordable price. Size is 14 inches diagonal with a display of 9.75 x 6.75 inches. A standard RCA pin connector easily attaches to the back of the monitor. Includes high clarity video image, built-in speaker with audio amplifier, and a headphone jack. May be used with a video recorder for home or professional use \$399.00.

Circle HelpCard No. 107
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Interface Cards

The **DiscMaster II** board allows you to connect two 8 inch or two 3.5 inch double density disc drives to your Apple II or Apple compatible computer. It will support single and double sided eight inch drives such as the Shugart 801/851 series and Shugart-compatible drives, as well as the Sony 3.5 inch. Includes software drivers to run under DOS 3.3, Pascal 1.1 and MicroSoft CP/M. These drivers allow you to use your existing disc drives in concert with drives controlled by the DiscMaster II board. It will also read and write standard CP/M 8 inch (IBM 3740 compatible discs) and IBM PC compatible discs. Contains integrated ROM and RAM memory which can be used to store the drivers, leaving the Apple II main memory free for use by your programs. Standard Utilities, including FID and FILER can be used to transfer files from drive to drive. Includes installation and integration instructions \$265.00.

Circle HelpCard No. 108
Data-Cue
5696 HWY 431 South
Brownsboro, AL 35741
(205) 883-2933

Miscellaneous

Kleen-Line conditioner is for complete microcomputer protection and interference control. Rugged construction assures heavy load start-up, crucial for disk and printer operation. Other features of this conditioner includes sine wave output, ultra-quiet operation, added input spike suppression, and wide-band pre-filtering. Regulation is to 117 VAC plus or minus 4 percent output for 90-140 VAC input. Standard and inter-socket Isolator models available in 250, 500, 100, and 2000 watt ratings.

Circle HelpCard No. 109
Electronic Specialists, Inc.
171 South Main Street
P.O. Box 389
Natick, MA 01760
(800) 225-4876

THE MAX is a low-cost surge and spike suppressor and noise filter combination device. It combines the fastest response time and the highest energy dissipation level possible. Provides the maximum protection to sensitive electronic equipment from transient voltage and line noise and improves circuit component and system reliability. Other models are available.

Circle HelpCard No. 110
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Circle HelpCard No. 112
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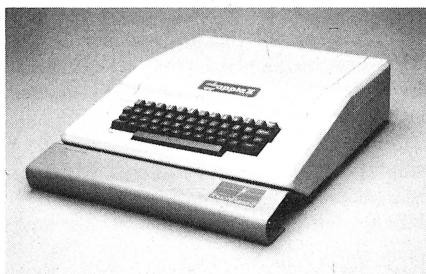
New users find the added convenience and speed to be indispensable for word processing, electronic spreadsheets, and program editing. Provides an easily adjustable time delay between first keypress and start of normal speed repeat, from 0 to over 3 seconds. High speed autorepeat is initiated by also pressing the Apple REPT key. This is also adjustable from normal to over 200 per second. Other handy features include an external on-off switch for autorepeat functions, a special terminal for easy connection to shift-key adapters, and a very compact design \$21.95.

Circle HelpCard No. 113

Pacific Computer Accessories
P.O. Box 25730
Honolulu, HI 96825

The **TouchBase 2** incorporates the functions of static control and wrist support in ergonomically designed keyboard stands. It slides easily under the front edge of the Apple II computer, and converts the Apple terminal base into an ergonomically correct keyboard with proper wrist support for greater user comfort. The static control covering on the wrist support area dissipates static electricity safely to ground via an easily installed grounding cord \$49.00. Other products available.

Circle HelpCard No. 114
Omnium Corporation
201 North Second Street
Stillwater, MN 55082
(800) 328-0223
(612) 430-2060 (MN)



The **Line-Saver**, an uninterruptible power system for use in the home and small business market, is engineered to give trouble free standby back-up power available in 120/240 volt, 60/50 Hz, with 250VA at .6P.F., 150 Watts capacity. The unit utilizes the latest "Pulse Width Modulation" technology to regulate the RMS AC output voltage. The PWM AC output will also increase battery efficiency to increase back-up time; 5-10 minutes at full load, 20-25 minutes at half load, 35-40 minutes at one-third load. In addition, the unit is furnished with an internal 12V sealed rechargeable battery, four "spike-spiker" voltage surge protectors and EMI/RFI filtered AC outlets, audible and visual power failure warning system, test mode indicator and switch with replaceable external fuses. Compact in size with external 12VDC battery connectors to allow for

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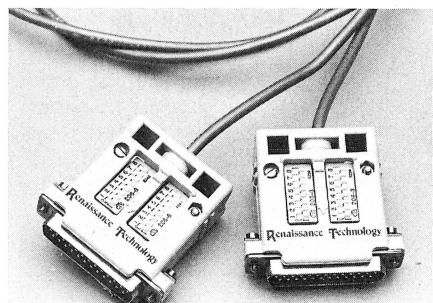
Circle HelpCard No. 115

Kalglo Electronics Co., Inc.
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Bethlehem, PA 18017
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With the **Universal Serial Cable**, almost any RS-232C serial computer and printer/peripheral interconnection can be made quickly and easily - eliminating the expense of hand-wired, custom-made interconnect cables. Two serial devices can be interfaced by simply adjusting a set of tiny DIP switches that are built into the Universal Serial Cable's connectors. Once the switches are set, the cable is plugged in and used as normal. Includes a handy cross-reference for computers, printers, and peripherals \$62.00.

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Renaissance Technology Corporation
1045 Detroit Avenue
Concord, CA 94518
(415) 676-5757



Datacam I and **Datacam 35** are two color graphic recording cameras which can record CRT images quickly and economically. Designed for professional applications, they can be used with personal and industrial computers. Each comes preassembled with molded handles that make it easy to carry for greater portability. All you have to do is place a Datacam on any CRT monitor and press a button to shoot. There are no complicated procedures for F-stop settings or exposures to remember. Anyone can use it from engineers, designers, medical professionals, and educators, to business professionals. Datacam 35 (35mm film) comes in two sizes - 12/13 inch and 19/21 inch monitor sizes to fit almost every available screen size. Datacam I comes in the same sizes for 3 x 4 instant prints (compatible with Kodak instant film).

Circle HelpCard No. 117

Photographic Sciences Corporation
770 Basket Road
P.O. Box 388
Webster, NY 14580
(800) 828-6489
(716) 265-1600 (NY)

Printers/Plotters

The Sweet-P 600 "Six-Shooter" graphic plotter draws charts, graphs and illustrations in six colors at a speed of 14 inches per second. Both paper and transparent projection film may be used - standard sizes are 8.5 x 11 inches 22 x 17 inches and ANSI equivalents. The plotter is compatible with most microcomputers and includes both parallel and RS-232 interfaces. Mainframe "eavesdrop" capability is also standard. In addition to its own graphics language, SPGL, Six-Shooter emulates the graphics language used to drive Hewlett-Packard's 7400 series of plotters. Six-Shooter has nineteen English and foreign language character sets, and is supported by an extensive selection of commercial software \$1,095.00.

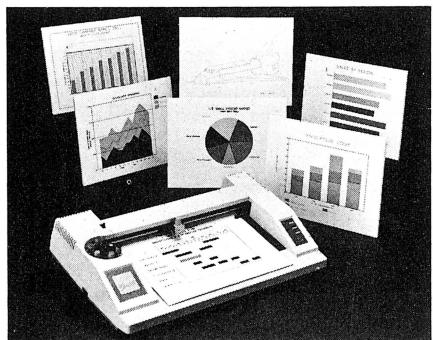
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Enter Computer, Inc.
6867 Nancy Ridge Drive
San Diego, CA 92121
(619) 450-0601



The DS220 multimode matrix printer provides correspondence printing for word processing, draft quality printing for high speed data processing as well as dot-addressable graphics. Designed to operate with high-performance micro and mini-based business systems, the DS220 eliminates the need for multiple printers by combining these 3 different printing capabilities into a single unit. It generates an 18 x 48 dot matrix for near letter quality appearance at 40 cps. Includes 2 correspondence quality fonts, 2 memo fonts, variable pitch draft fonts and a special

micro-character set. Also resident are 7 international character sets. For print intensive applications, the DS220 operates at 220 cps utilizing bidirectional logic-seeking printing. Throughput approaches 450 lines per minute with a 9 x 7 matrix at pitches of 10, 12 or 16 cpi (expanded or normal). Dot addressable graphics lends itself to be used with many popular microcomputer software programs. Both parallel and serial interfaces are included with a 2000 character buffer \$1,995.00.

Circle HelpCard No. 120
Datasouth Computer Corporation
4216 Stuart Andrew Blvd.
Charlotte, NC 28210
(704) 523-8500



The ComScriber I plotter gives users of most personal computer systems the capability of making charts, graphs, and illustrations in several colors. Paper size is 8.5 inches wide by 1 inch to 10 feet long. Easy to learn and operate, it is available at a price much lower than comparable plotters of this class. It is small and lightweight enough to be carried in a briefcase. It produces letters and symbols by using a pen to draw visual images with high resolution and excellent line quality. Line segments are accurate to one four-thousandths of an inch. The plotter draws at a speed up to six inches per second. It can use either manufacturer-supplied or commercially available standard pens, paper, and transparencies. A pause feature permits easy changing of the pens for color. Features a 12-key keyboard, self-test, and alphanumeric characters \$695.00.

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SOFTWARE

Business (General)

Busi*Math contains over 80 formulas that deal with all facets of the time value of money calculations. It works on any Apple II or the ICM PC using one of the spreadsheets: VisiCalc, SuperCalc, Multiplan or 1-2-3. With Busi*Math and a spreadsheet the user is able to print amortization schedules. It teaches the user to customize and design his own schedules. The most powerful feature of Busi*Math is that each of the eighty formulas can be used not just as templates but as algebra that can be moved easily into a model or template. The user is thus able to build financial models to fit his specific needs. Each formula is represented by a manual page which is self-contained. The user types a simple command which loads a formula in just a few seconds. Each variable is entered in exactly the same place for each of the formulas with the result that data entry is fast and easy. The manual is indexed, includes a glossary where financial terms are clearly defined and, most important, has clear instructions with illustrations for ease of use \$245.00.

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Data Base /// allows up to 32,760 records per file with up to 200 fields per record. It will do whole or partial field searches and has a built-in report generator to easily create and modify custom reports. It also has the capability to interface with Apple Writer ///. It has features such as preformatted fields, including date, dollar, phone number and others. Also, passwords and automatic syntax checking are supported. The report generator includes such features as automatic page numbering, calculations, totaling and user defined custom layouts. The program is menu driven. It supports the ProFile hard disk \$250.00.

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Work Force II is a collection of six ultra-friendly programs for home or office. It features: The Balancing Act - a once a month checkbook balancing program, The Calculator - a four function printing calculator with memory and percent, The Loan Analyzer - loan and mortgage amortization, The Saving Analyzer - analyzes future value of savings, investment, and rates, The Wage Analyzer - examines and calculates your income and pay raises, The Line Writer - a line at a time correctable

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The **Management Edge**, **The Negotiation Edge**, and **The Sales Edge**, are among the first of what are called "expert" systems to be used with personal computers. In conversational English, they elicit from the user information about himself, the situation, the goal, and the opponent or employee. This information is then combined and analyzed, and the user is provided with an easy to read print out that "walks" him or her through the proper scenario to achieve the optimal resolution. The Negotiation Edge helps to develop a strategy for negotiating the best possible deal, and uses the latest theories to help managers improve their supervisory skills. It can tackle a number of tasks including: resolve conflicts between the manager and subordinate to develop a strategy for negotiating the best possible deal, uses the latest theories to help managers improve their supervisory skills, increase productivity and motivation, improve communications, locate the proper position for the employee, deal with the problem of discipline or termination, etc. The Sales Edge allows the salesperson to present himself and the product to a prospective buyer in the most appealing manner. This is done by presenting the salesperson with a strategy that adapts his or her selling style with what the buyer is searching for. Each retail for \$250.00.

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TeleSchool is the first complete student record-keeping and report writing system developed specifically for elementary school administration. The system maintains up to 48 data items for each student, storing records for up to 400 students on one diskette. With additional diskettes, up to 1100 student records can be processed at one time. Of the 48 student data categories, 12 are built into the system. The remaining 36 "special programs" are determined by the school anytime. These data items are used by TeleSchool to create profile reports by room, grade, or for the entire school. It also uses this information to create dropped student lists, folder and address labels, and room rosters. Special reports may also be created by using the

"inquiry" function. TeleSchool is written in run-time Pascal and uses keyed index files to efficiently use the capabilities of Apple microcomputers. Requires any Apple II, 2 disk drives and a printer. Includes a Program Diskette, an Owner's Manual, a step-by-step Training Course and a sample Student Record Database for use with the Training Course \$549.

Circle HelpCard No. 127
Telos Software Products
Education Division
3420 Ocean Park Blvd.
Santa Monica, CA 90405
(213) 450-2424

Educational

SoftVue tutorial videotapes are the easy way to learn to use computer programs such as AppleWriter and the entire PFS: series. Forget the manual, learn and teach by watching, then take a short quiz in the Study Guide, or check your answers on the Review page. The chapter quizzes are on tear-out pages so copies can be made for classroom use. Ideal for school, office, or user-group libraries. This series has been designed by educators and produced to television network standards. \$250 for the first copy of a title, \$125 for all additional copies of that title. Additional copies of the Study Guide are also available from the manufacturer. Tutorials now available are AppleWriter, PFS:File, PFS:Report, and PFS:Graph.

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Two new educational releases from K-12 MicroMedia are available. **Picture-Writer** makes it easy and challenging to draw, play with and color images. The program includes a built-in tutorial, games and a joystick-operated "coloring book." Recommended for children from ages 5-12. Helps teach children spatial relationships, colors, geometric patterns, visual-motor skills; draw and edit computer commands while providing an enjoyable means of creative expression. **SongWriter** is a true music processor enabling students to compose, play back, edit and save. It requires no musical background. Includes a manual with educational activities and a music library of 28 popular tunes for ages 5-12. Both programs are available for the Apple and other computers at \$39.95 each.

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K-12 MicroMedia, Inc.
172 Broadway
Woodcliff Lake, NJ 07675
(201) 391-7555

Super Quiz II is a multiple choice test generation system which saves the teacher time for more productive activities. System enables the teacher to create a test bank of up to 10,000 questions; add, edit,

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Basic BASIC is a simple introduction to programming a personal computer using the BASIC language. It is designed for situations in which the instructor is not a computer expert and each student in the class does not have access to a computer during the class period. If you have twenty or thirty students and one or two computers this is the program for you. Students can learn the beginning syntax and "vocabulary" of BASIC without tying-up the computer. This two part slide or filmstrip program provides numerous examples and opportunities for students to write their own short programs to strengthen their understanding. "Generic" BASIC is taught so that the program can be used no matter which brand of computer you use. Slide format contains two trays of slides with cassette narration for \$119.00. Filmstrip version contains two filmstrips with cassette narration for \$64.00. Both versions include a teaching guide and student worksheets.

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The Learning Seed Company
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Financial

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Sterling Swift Publishing Company
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Winning on Wall Street is a new and highly sophisticated stock market decision

support software system. The new three module, fully integrated software system offers four products: *Trader's Data Manager*, *Trader's Forecaster*, *Trader's Accountant*, and *Winning on Wall Street - The Complete System*. Data base maintains daily, weekly, monthly, yearly and quarterly data simultaneously, including up to twenty years of annual data. Furthermore, it provides the flexibility to record, store, graph and report almost any type of investment security. The forecasting capabilities include moving averages, exponential smoothing, adaptive filtering, least square fit, etc. The accounting module is capable of producing 10 distinct reports on up to 999 portfolio accounts within which stock transactions may take place. The complete system includes all three modules on one program diskette. Individual modules may be purchased separately and then later combined onto a single diskette. *Trader's Data Manager* \$200, *Trader's Forecaster* \$250, *Trader's Accountant* \$350, *Winning on Wall Street - The Complete System* \$700.

Circle HelpCard No. 144
Summma Software Corporation
P.O. Box 2046
Beaverton, OR 97075
(503) 644-3212

hours on end. Games for Kids operates on an Apple II Plus or //e and does not require game paddles \$39.95.

Circle HelpCard No. 146
SouthWest EdPsych Services, Inc.
P.O. Box 1870
Phoenix, AZ 85001
(602) 253-6528

Enchanter is the first in a new series of fantasy games that will take players into a world of magical powers and perilous predicaments. Enchanter is written in the ZORK tradition by the same authors but with new and different settings. They have created a game that requires players to use high levels of skill and logic in overcoming "Krill," the evil warlock whose ever-increasing powers have shattered the peace of this fantasy kingdom. The emphasis is clearly on magic. \$49.95.

Circle HelpCard No. 147
Infocom, Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031

In arcade games players strive for the highest score; in **Snackmaster** the winner is the player with the lowest total - the lowest calorie count wins. Each player takes the role of "Snackmaster" whose task is to select between-meal treats for "Snackman." Ten temptations to snack are presented and the snackmaster must make selections that lead to the lowest possible calories count. Snacks are presented in random order, so luck enters the picture as in life. Ten selections that total less than 1200 calories is a winning play. The computer reveals calorie counts after the selections and keeps track of the names of students with the five lowest scores. The program simulates real life snack choices and encourages calorie consciousness. It teaches which snacks are least likely to unbalance a diet. The Snackmaster program contains a large selection of snacks so the game can be played repeatedly. The more the game is played, the more students will learn \$36.00.

Circle HelpCard No. 148
The Learning Seed Company
21250 N. Andover Road
Kildeer, IL 60047
(312) 438-3251

Have you ever wanted to pilot your own plane? Let **Flight Simulator II** put you at the controls of a Piper 181 Cherokee Archer with full flight instrumentation (avionics included) and colorfully realistic panoramic view. Lets you practice take-offs, landings, even complicated aerobatics. The program features over 80 airports in four scenery areas; New York, Chicago, Seattle, and Los Angeles. Complete navigation facilities are included. Additional scenery areas are also available. High speed color-filled 3D graphics provide a spectacular view of the outside world in either day, dusk, or night flying modes. Weather conditions are user-

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Games/Simulations

In "The Alpine Encounter", VODAC, a brilliantly sinister organization has stolen the plans for the world's first truly invincible missile. The plans must be recovered in order to avert a worldwide disaster. It is up to you! It is a highly sophisticated, extremely interactive game with a spy thriller scenario. It features 93 full-color scenes and 28 personalities with which the player interacts. Two-voice music and numerous sound effects are featured. Arcade ski sequences add another dimension to the game. Although it comes on two disk sides, it is designed to operate on a single disk drive. Players use regular English sentences to alter the actions of the characters, creating hundreds of possible paths to the ultimate outcome. Thus far, 48 conclusions have been discovered \$59.95.

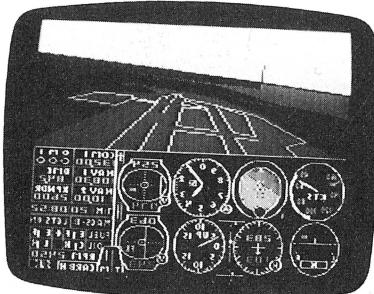
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Games for Kids includes twenty carefully crafted games which appeal to boys and girls aged 3 through 12 years. Music, sound effects and color graphics entertain children of diverse interests and skills for

adjustable, from clear blue skies to grey cloudy conditions. Complete documentation (including flight handbook) will get you airborne quickly even if you've never flown before. When you think you're ready, you can test your flying skills with the WWI aerial battle game that's included \$49.95 plus \$1.50 shipping.

Circle HelpCard No. 149

SubLOGIC Corporation
713 Edgebrook Drive
Champaign, IL 61820
(800) 637-4983



Graphics

Charts Unlimited is a new drawing software program. It combines machine language speed and a 16-screen drawing area. Apple II & //e users can now get fast graphics and more drawing area for high-quality charts and graphs. Can be used to draw flowcharts, floor plans, office layouts, organization charts, forms, PERT charts, business charts, block/wire/circuit diagrams, virtually any type of chart. Most users can draw new charts in a matter of minutes. Changes such as rearrange, enlarge, and overlay will take only seconds. The program uses the same style of command entry and screen scrolling as that of VisiCalc. The worksheet grid is 124 columns by 90 rows. This represents a graphics area of 868 by 630 pixels, which is 10 times more area than the Apple's Hi-Res graphics screen. Output can be to almost any dot-matrix printer/interface card combination. A "View" feature permits users to see a compressed view of their entire chart while working on 1/16th of the chart that is displayed for detail drawing. Complete with 36 predefined objects and 36 symbols. Users can also create their own objects that can be stored on a diskette and loaded at any time \$195.00.

Circle HelpCard No. 150

Graphware Inc.
5084 Mosiman Road
Middletown, OH 45042
(513) 424-6733

HyperGraphics is a complex, color graphics package that runs on any Apple //e or IBM PC. The product is written in assembly language and BASIC using encoded

graphics which makes it extremely powerful. Some of its unique features are its ability to store up to 1,000 color graphic screens on a 320K diskette, its use of only 10 function keys to create and dynamically edit graphics and animation, and its ability to store screen images and interact with other data or software. It can be used as an authoring language for computer assisted instruction tutorials, to create stand-up presentations or sales demonstrations, to create marketing diskettes, or as an imbedded part of other software programs. It can also pick up a screen from another software package that is buffer-stored and convert it to color graphics, making that piece of software come alive. HyperGraphics requires 128K of RAM. Comes with professional quality user documentation, a tutorial disk, and two system disks for \$395.00.

Circle HelpCard No. 151

Hypergraphics Corporation
1908 Stonegate Drive
Denton, TX 76502
(214) 783-9900

Graphics Department combines all of the most commonly requested graphic functions: plotting, chart generation, a lettering kit, graphics editor, and slide projector. These are all integrated into a single system with a consistent, menu-driven user interface. Its Chart Generator Module converts tabular business data or

VisiCalc DIF files into colorful pie, bar, scatter, and line graphs. The graph axes are automatically scaled and labeled to speed up and simplify the design process. The Graphics Editor Module can be used to "paint" a picture from scratch, redesign an existing picture, or to just put the "finishing touches" on a chart. Over 20 different character fonts in a variety of sizes and directions can be used to letter anywhere on a picture. Lets you "cut and paste", "overlap" and merge portions of pictures. Entire pictures can be flipped, shrunk, inverted, or masked out. Color patterns can also be added and the entire color of a picture changed \$124.95 plus \$1.25 for postage and handling.

Circle HelpCard No. 152

Sensible Software
6619 Perham Drive
West Bloomfield, MI 48033
(313) 399-8877

Robographics CAD-1 Computer Aided Design System connects to any Apple II microcomputer and produces scaled, technical drawings and custom graphics. Designers, illustrators, educators, and other business professionals can use this system to create building plans, mechanical drawings, schematics, flowcharts, and business graphics. The CAD-1 system works with the standard, off-the-shelf Apple computer. A complete hardware/software configuration including plotter is

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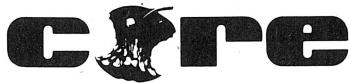
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available for as little as \$4,920, yet this system emulates CAD installations costing over \$15,000. No computer knowledge or typing skill is required to operate the system. First-time users can attain a high degree of proficiency without formal training - just a few hours practice are needed using the tutorial in the User Manual. For professional quality output from the system, two Robographics drafting plotters are available to produce line-perfect drawings up to 22 x 34 inches (D size). For proof copy, any dot-matrix printer with graphics dump capability can be used. Price of the CAD-1 software, controller and user manual is \$1,095.00.

Circle HelpCard No. 153

Chessell-Robocom Corporation
125 Pheasant Run, Suite 2B
Newtown, PA 18940
(215) 968-4422



The Routine Machine is a programming system that puts machine language subroutines into your Applesoft BASIC programs. BASIC programmers can create completed programs which are smaller and faster in execution speed than a compiled equivalent, and because of the diverse nature of the routine libraries, one can create a wide range of software applications without having to program the more complex levels of common subroutines. Requires no knowledge of machine language programming. Four new library disks add over 150 new subroutines to a continually expanding library. The Routine Machine is fully compatible with any Apple II - \$64.95. Each of the four library disk packs is \$49.95.

Circle HelpCard No. 155

Southwestern Data Systems
P.O. Box 582
Santee, CA 92071
(619) 562-3221

Music

Simply Music system is designed for professional musicians and educators. It consists of software, recorded music, and custom music courseware which are used with the Simply Music instrument. The total system, including keyboard, software and Apple II computer, is priced below many popular home organs, yet offers a set of features which have never before been available at an affordable price. You can see the musical notes being played on a TV screen representation of the musical keyboard, or in musical notation on a grand staff, or in a set of colored bars corresponding to the notes played in each octave. For learning keyboard playing skills and to accurately follow a pre-recorded piece, the Match feature causes the musical playback to pause and wait until you play the correct key on the musical keyboard and then continue. For listening enjoyment as well as learning, multi-part music pre-recorded with the Simply Music 16 part recorder is available. The full system includes: a four or five octave musical keyboard with Apple interface, sound synthesizers (16 voice), software (system diskette, pre-recorded music, personal song diskette, 110 sounds (10 groups of 10 each), and a self-demo diskette) and manuals. The four octave system retails for \$995.00, the five octave for \$1,295.00. Simply Music courseware cost from \$29.50 to \$59.50 depending upon the method, number of diskettes for music, and workbooks provided.

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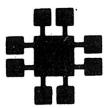
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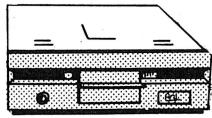
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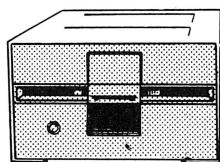
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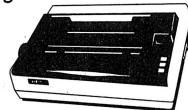
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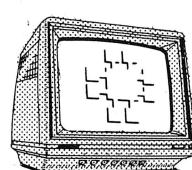
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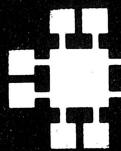
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 - User Group
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 - News Stand
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 - Subscription
 - Book Store
 - School
2. I personally use most:
 - Apple II/Plus
 - Apple //I
 - Apple Workalike
 - Apple II/e
 - Lisa
 - IBM PC or workalike
 - Don't own yet
 - Other
3. I have owned a microcomputer since
 - before 1977 1977
 - 1978 1979
 - 1980 1981
 - 1982 1983
 - not yet
4. I use my computer primarily for
 - Home
 - My Business
 - Hobby
 - Education
 - Other
5. I use my computer primarily with
 - Word Processor
 - Business Software
 - Modem
 - Graphics
 - Electronic Spreadsheet
 - Data Base
 - Games
 - Control of other Devices
6. I spent on software in the past 12 months:
 - less than \$100
 - \$100 - \$300
 - \$300 - \$600
 - \$600 - \$1,000
 - More than \$1,000
7. Regarding User Groups:
 - I belong to a local group
 - I'm active in a User Group
 - I have never belonged to a local group
 - I used to belong to a local group, but don't now
8. My vote for the best article in this issue is
9. My vote for the best ad in this issue is (Reader Service) number

Check each advertisement for corresponding number and circle below:

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022	062	102	142	182	222	362
023	063	103	143	183	223	363
024	064	104	144	184	224	364
025	065	105	145	185	225	365
026	066	106	146	186	226	366
027	067	107	147	187	227	367
028	068	108	148	188	228	368
029	069	109	149	189	229	369
030	070	110	150	190	230	360
031	071	111	151	191	231	361
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033	073	113	153	193	233	363
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039	079	119	159	199	239	369
040	080	120	160	200	240	999

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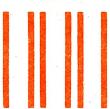
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 - Apple II/Plus
 - Apple //I
 - Apple Workalike
 - Apple II/e
 - Lisa
 - IBM PC or workalike
 - Don't own yet
 - Other
3. I have owned a microcomputer since
 - before 1977 1977
 - 1978 1979
 - 1980 1981
 - 1982 1983
 - not yet
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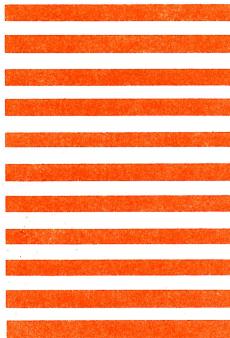


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*Modems supported: Hayes Micromodem II or Ile, Smartmodem 300 or 1200 (with Apple Super Serial Interface), Novation Apple-Cat II and compatibles of these.

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the country. It also gives you many gardening tips to help you get the best possible yield from your garden with the least work \$29.95.

Circle HelpCard No. 157
Home & Hobby Software
4936 Morgan Avenue South
Minneapolis, MN 55409
(612) 925-2591

Bearings is a computer program to find out which way to go. You specify your spot on the globe by entering your latitude and longitude. Then the computer calculates and prints out the distance and direction from your place to over 500 other cities throughout the world. Directions are given in the azimuth system where north is called 0 degrees, 90 degrees is east, 180 is south and so forth. These directions are the great circle directions as used by pilots or skippers, the shortest paths between two points on the Earth. Bearings can be used by anyone needing directions such as radio amateurs to align their antennas, pilots to plan trips, architects to align buildings and armchair navigators of all types. The program is fun to use as an exercise in geography. The output is ordered by country and city and includes amateur call prefixes for each location. Any 80 column printer can be used. For any Apple II or the Apple //e and other computers as well. Requires 64K and one disk drive. \$19.95.

Circle HelpCard No. 158
Zephyr Services
306 South Homewood Avenue
Pittsburgh, PA 15208
(412) 247-5915

What Did You Eat Yesterday? gives a diet analysis based on the food eaten yesterday. Each user's nutritional needs are calculated and the diet is analyzed for calories, vitamins, fat, protein, sodium and other nutrients. A diet analysis is printed (on the screen or on a printer) and excesses and deficiencies are noted. The program's data bank stores hundreds of foods and is based on 1980 RDA's and the newly revised food composition values released by the USDA from 1980 through 1983. The program is useful as a diet check and a teaching aid to help learn what is needed for a balanced diet \$39.00.

Circle HelpCard No. 159
The Learning Seed Company
21250 N. Andover Road
Kildeer, IL 60047
(312) 438-3251

Fast Food Micro-Guide will provide a computerized analysis of your fast food meal. Slip this disk in your computer and it will ask you "Where do you want to eat today?" The choices include the largest national fast food franchises: McDonald's, Burger King, Kentucky Fried Chicken, Wendy's, Dairy Queen and others. After you select where to eat the computer presents the menu as it exists at

that franchise. You select a typical meal from the menu and the computer will print out (to the screen or printer) a nutritional analysis of the meal showing calories, what percentage of the calories come from fat, protein analysis, vitamin A, B, and C content and amounts of other nutrients. A teaching guide is also included to aid in an interpretation and study of the results. Students learn nutritional decision-making and find out how their typical fast food order stacks up nutritionally \$36.00.

Circle HelpCard No. 160
The Learning Seed Company
21250 N. Andover Road
Kildeer, IL 60047
(312) 438-3251

"Handicapper" is a golf handicap management system created by a PGA golf professional to provide handicaps which conform to those of the United States Golf Association. But "Handicapper" provides users with more flexibility than the USGA system allows. For example, users have the option of updating their handicaps more often than every two weeks, which is the interval prescribed by the USGA system. Users can also set handicap maximums at any value from 1 through 54. With the USGA system, 18-hole handicaps are limited to 36 for men and 40 for women. This program can also manage handicaps for 9-hole scores, making it especially valuable for corporate golf leagues. This easy to use, menu driven program maintains as many as 400 separate handicaps on a single data disk (375 with Applesoft BASIC version). Complete editing and printing features, including printing handicap cards, distribution lists and rankings, etc \$175.00. Available in Microsoft BASIC 5.0 and CP/M 2.2.

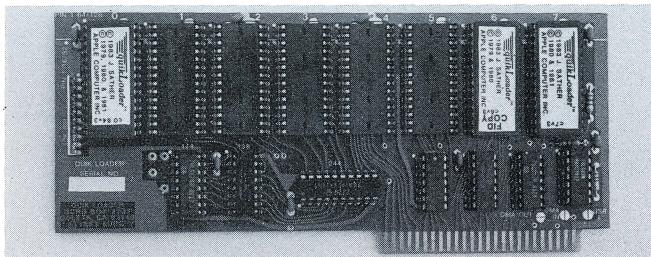
Circle HelpCard No. 161
Golfsoft, Inc
10333 Balsam Lane
Eden Prairie, MN 55344
(612) 941-2172

Utilities

SCAT //e is a disk file management tool which doubles as an excellent HELLO program on boot diskettes. It will greatly reduce the number of keystrokes in normal disk file options, and will provide more information (in a more useful fashion) with less time and effort. Printed reports are made by touching only two keys. Prevents Bad Path and Disk Switched errors. Supports single or multiple (1-4) drives - combines catalogs. A multi-pass feature combines catalogs from dozens of diskettes. Written in BASIC - provisions for user enhancement - copyable. Complete instructions provided \$39.95. //EDIT is a BASIC program development tool for programmers who want to save time and effort. This utility provides a framework for the program you will write, and has built-in tools for editing, testing and debugging that will delete themselves from

SCRG

quikLoader



SPEED

The quikLoader is the *fastest* way to load programs. **BAR NONE!** Applesoft, Integer, or machine language programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. The quikLoader operating system can keep track of over 250 programs stored in **PROMs** (Programmable Read Only Memory). The user simply transfers any of these programs to PROM using the instructions packed with the unit, and any PROM programmer, or we will provide this service.

CONVENIENCE

How many times have you started to work with a frequently used program, only to find that you have misplaced the disk, or worse, had the disk damaged; or the dreaded "I/O ERROR" message flash on the screen. With the quikLoader, these nightmares can be a thing of the past. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly. If you do need to use standard disks, the quikLoader even speeds up that process. For example, to catalog a disk, just press **ctrl-C** Reset. To run the "HELLO"

program, press **ctrl-H** Reset. Other "one-key" commands include entering the monitor, booting the disk, calling up the mini-assembler, etc. The major difference between the quikLoader and the other ROM cards is the complete operating system (in PROM). This enables you to get the quikLoader catalog on the screen (by pressing **ctrl-Q** Reset), allowing you to see what programs are available. Loading or running of the desired program requires one keypress. Program parameters, such as starting address and length of machine language programs can be seen on the catalog screen, if desired.

EASE OF USE

The quikLoader plugs into any slot of the **APPLE][or //e**. The card is reset driven. To use any of the many features of the card, **RESET** is pressed in conjunction with a key. The particular key pressed chooses the feature.

VERSATILE

The quikLoader will accept any of the popular PROMS available on the market, 2716, 2726, 2764, 27128 and 27256. These types may be freely intermixed on the card. Long programs can take up more than one PROM, or several short programs may be stored on one PROM. The quikLoader operating system even handles multiple cards, so you can easily double or triple the amount of PROM memory available. The ultimate memory capacity of one card is 256K, so many frequently used programs and utilities can be stored. We even start your library of programs with the most popular utilities on the card, **FID** and **COPYA**. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

INCREASED DISK CAPACITY

Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 10% additional space for programs and data on your disks.

SYSTEM REQUIREMENTS

The quikLoader will work in an **APPLE][,][+, or //e**. If used in a **][+**, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

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AMPERSOFT

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There you are, sitting in front of a dead screen, wondering if your Apple has broken down or if your program has gone to sleep.

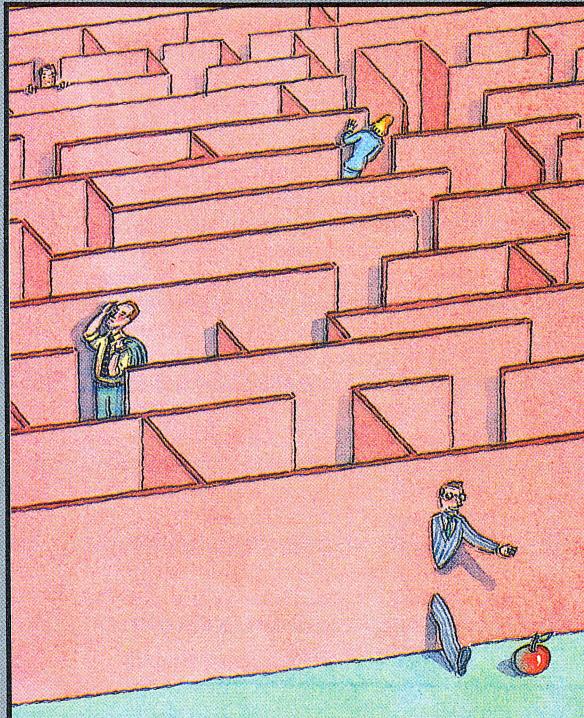
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If most programs take away memory, this one gives it back. AMPERSOFT is the only Applesoft enhancement package that puts DOS and itself in the upper 16K of a 64K system, giving you a new usable gain of thirty percent instead of a net memory loss.

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Selective array clear.
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Two-key disk commands.
Compatible with GALE, PLE, FID, MUFFIN, COPYA and all DOS Toolkit programs.
Allows concurrent residence of Applesoft and Integer BASIC with 32K RAM card, extra 16K card, or ROM card in another slot.

AUTHOR:

Cornelis Bongers

SYSTEM REQUIREMENTS:

At least 64K, Applesoft, DOS 3.3 and one Disk Drive. Operates with all Applesoft-Compatible computers including the Apple IIe and the Franklin ACE. Apple II Plus requires RAM card — 16K or larger.

PRICE:

\$49.95 postpaid

ORDERING INFORMATION:

If your Apple dealer doesn't have AMPERSOFT you may order directly by mail or phone. (Mass. residents please add 5% sales tax.) We also accept VISA and MasterCard.

MicroSPARC Inc.

10 Lewis Street, Lincoln, MA 01773 (617) 259-9710

Circle HelpCard No. 33

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the final perfected program (if desired). It even provides built in routines you might frequently use, saving you the trouble of reinventing the wheel \$39.95. // Number is a flexible BASIC program renumber utility having features not likely to be available. Renumbering is reasonably fast and you get to watch it happen. An added feature allows line number cross-referencing, while another lets you delete any Break Points you set using //EDIT. Lots of options are offered for flexibility \$39.95.

All three programs are available in the "/// Pack" for serious users for \$89.95. VISA/MC orders accepted.

Circle HelpCard No. 165
Expanding Space Software
4639 SE 34th
Portland, OR 97202
(800) 547-5006

COPY-CAT is a copy and catalog editing utility available for any Apple II. It's many features include: file copying, converting, comparison, locking, unlocking, deleting, undeleting, and verification. It will initialize diskettes, copy DOS, change greeting program names, test active sectors and graphically display the VTAC map. It includes a sophisticated, menu-driven catalog editor that quickly creates unique and functional custom catalogs. The catalog editor supports catalog listing, deleting, sorting, individual name movement, renaming, mass locking and unlocking, ex-

huming of deleted files, and zero-size file creation. The diskette also features COPY-QUIK, a fast copy utility that contains an option to copy only the active tracks thus reducing the actual copy time to a minimum. Complete with 30 page User Manual and diskette \$29.95.

Circle HelpCard No. 166
Southwestern Data Systems
P.O. Box 582
Santee, CA 92071
(619) 562-3221

Master Cat makes a combined catalog of all the files on all of your disks, organized alphabetically. Once this "master" catalog is created, it can be printed on paper for everyday use. Anytime you need to find a particular file or program, you simple look it up in your master directory and locate the correct disk. It only takes a few minutes to build a master directory, even for a large collection of disks. Completely menu driven. Automatically sorts as each catalog is read, so there is no need to perform a separate sorting operation. It can also list the catalog alphabetized by your choice of file name, file type or disk number. Works with any printer. Customize to any printer without having to write a special machine language program. Special search and "wild card" features allow you to print all files of a certain type. Other features include: displaying deleted or hidden files, sorting by file type (optional), and saving the master catalog to disk \$39.95 plus \$3.00 shipping.

Circle HelpCard No. 167
Fountain Computer Products
1901 Kipling
Lakewood, CO 80215
(303) 232-8346

Homeword, a word processing program that represents a major technical breakthrough, is the first software specifically designed for the home computer that uses icons, or symbols, to guide the user through the program. The icons replace the complex documentation usually associated with utility software already on the market. With Homeword, there is no need to memorize complicated procedures or learn endless lists of commands. Using it's friendly icons as a guide, any member of the family can easily write and print personal letters, address lists, phone numbers, recipes, monthly budgets, etc. Functions offered are *EDIT*: erase, insert, move, copy, find, find/replace; *FILE*: insert, get, save, and include documents; *PRINT*: See final document, page number set, type of paper; *LAYOUT*: Set spacing, new page, alignment, indented point, print style, headings/footings; *CUSTOMIZE*: make backup documents, change preset margins, save customized choices, configure points, type of printer, accessories; *DISK UTILITIES*: Prepare document disk, erase document, catalog disk, exit \$49.95. 30 day money back guarantee.

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Word Processing

MegaWriter is a word processor with mail merge that retails for \$99.95. It is a full-featured word processor which is comparable to others costing three or four times as much. The new program comes complete on a single disk. Improvements in the new version include a faster boot time, settable tabs, and the ability to read and write both Apple DOS files and Pascal files. It automatically configures itself to either the Apple II or //e computers and takes full advantage of the //e keyboard. MegaWriter allows extensive print formatting and is extremely easy to use. The entire family of programs is a powerful document preparation system which includes *MegaWriter*, *MegaSpell* (a spelling checker) and *MegaFinder* (a file manager and report generator).

Circle HelpCard No. 168
Megahaus Corporation
5703 Oberlin Drive
San Diego, CA 92121
(619) 450-1230



Pen-Pal is a new, flexible, and powerful word processing program. It is easy to use regardless of the user's experience level. Five help menus are provided, and commands have been simplified to a minimum number of keystrokes. Editing features include global search and replace; global search and delete; and block manipulations, including delete, copy, load and store. Formatting features include left and right justification, centering, pagination, headers and line length. Line lengths can be up to 254 characters. Two modes provide visual flexibility: in the "Thinks" mode, text is entered without any format considerations and is viewed in 40-column form. The "Looks" mode allows text to be viewed as it will look in printed form. Minimum system requirements are an Apple II compatible system, 48K RAM, DOS 3.3, one disk drive, and printer. Game

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Associated Technology announces a four-volume reference set which is designed to serve as a software management tool for establishing a company's internal programming and documentation practices. Three of the volumes cover standard methods for programming in COBOL, FORTRAN, and BASIC. The fourth covers software documentation practices. The set sells for \$45.00.

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Computer Skill Builders' 1984 catalog of microcomputer resources for the classroom has just been published. The catalog contains 321 computer-related products for education from 52 publishers including 141 software programs, 180 books, and computer classroom supplies. Featured products include Computer Skill

Builders' LOGO Task Cards, LOGO Visual Masters, Pascal Task Cards, and PLATO courseware by Control Data. For a free copy of the catalog write to the publisher.

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(602) 323-7500

If you don't yet know a diskette from a data base or a bubble sort from a breakpoint, "**The Computer Dictionary**" can save you valuable downtime - and multiply your enjoyment and expertise by many times. This dictionary gives you all the basic computer terms (like BASIC) as well as newly-coined computerisms like "zeroing", "bit map", and "firmware" - all in alphabetical order. Every entry comes complete with an expanded, "reader-friendly" definition that shows you just what the word means. Whether you're an expert or a novice, this is the one book to own if you want to understand everything you read about the dynamics of the computer world. Paperback, 128 pages with line drawings \$4.95.

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Running Press
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(215) 567-5080

"The Book of Apple Software 1984" is the world's top-selling, most comprehensive reference guide for Apple II & //e software. Using a Consumer Reports style format, each program is described, evaluated and rated by independent reviewers, each an expert in his or her field. Programs are graded on an A to F scale in such areas as ease of use, documentation, value for money and vendor support. Also, an overall grade is assigned to each program. It contains reports on the most recently introduced programs along with updated reviews on the latest versions of previously introduced programs. Also included are a list of software vendors and advice on obtaining maximum use and enjoyment from Apple II & //e computers \$19.95.

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The Book Company
11223 S. Hindry Avenue
Los Angeles, CA 90045
(213) 410-9466

"The Apple Circuit Description" is an essential reference for those who service, design for or rigorously use the Apple II computer. It covers all versions of the original Apple II and Apple II Plus main logic board plus the single and double piece keyboards. A block diagram of the Apple II is the foundation for detailed descriptions of such advanced topics as daisy chains, interrupts, system clocks, direct memory access and ready line. Tutorials introduce video techniques and explain how Apple's video circuitry works. It also covers memory ICs, 4116 RAM, the 6502 CPU, peripherals and more. Numerous schematics and verified waveforms help make service and repair easier. Several appendixes list all known circuit revisions of the Apple II mother board and keyboard, the differences between these revisions and more \$22.95.

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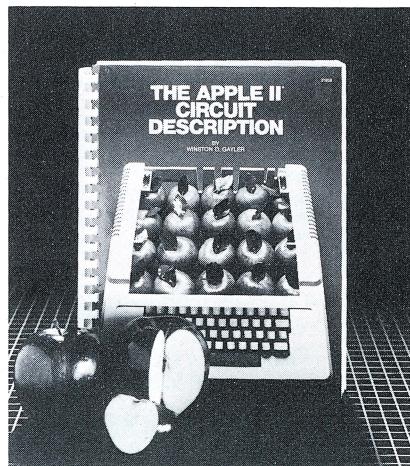
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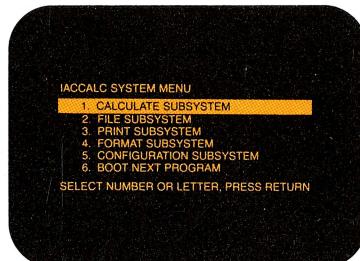
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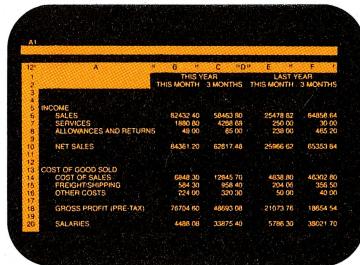
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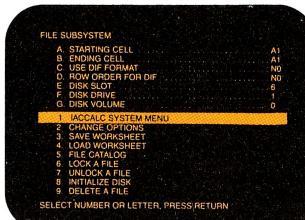
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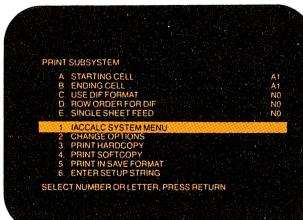
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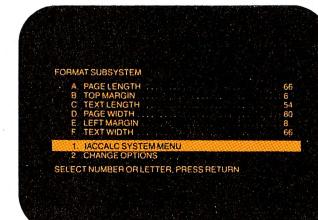
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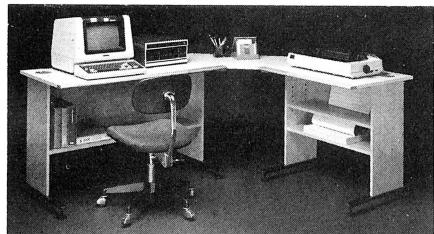
This attractive, dark tan case is a safe, convenient way to tote an Apple computer home, and back to office or class. It is foam-padded and completely lined for extra protection with a full wrap-around zipper for easy access and a weather-tight seal. Exterior pockets accommodate two disk drives and an interior pouch holds diskettes securely. A safety handle and a detachable shoulder strap make it easy and comfortable to carry. \$39.95.

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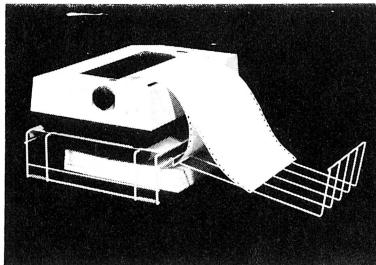
characters, the filters are available in different colors, including green and amber for black and white screens and neutral grey for full-color screens.

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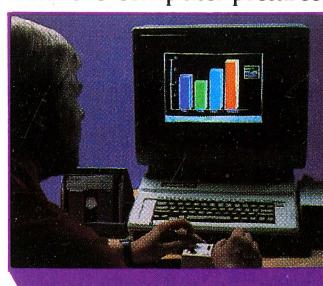
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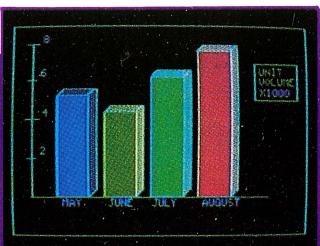
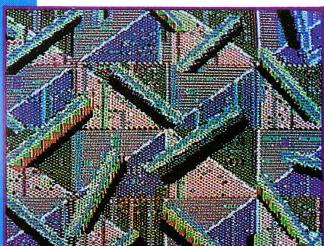
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*Apple II+, IIe with 48K

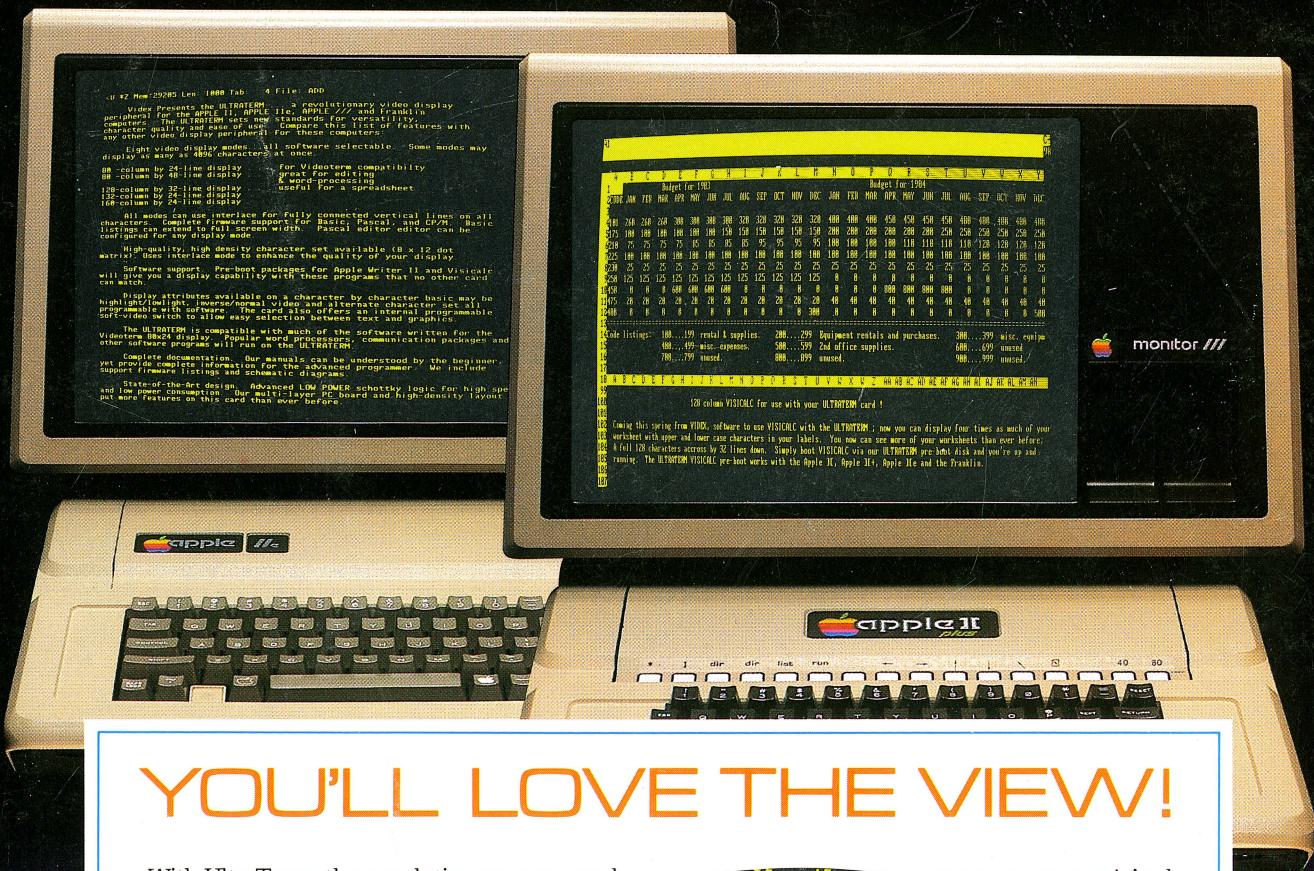


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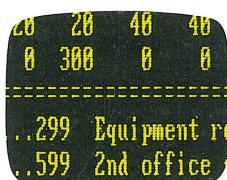


Photo of actual-size characters on Apple Monitor III.

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